ENTOMOLOGICAL NEWS

AND

PROCEEDINGS

OF THE

ENTOMOLOGICAL SECTION

OF THE

ACADEMY OF NATURAL SCIENCES

OF

PHILADELPHIA.

259108

VOLUME XXX, 1919

PHILIP P. CALVERT, Ph.D., Editor.
E. T. CRESSON, Jr., Associate Editor.

HENRY SKINNER, M. D., Sc. D., Editor Emeritus.

Advisory Committee:

EZRA T. CRESSON
PHILIP LAURENT
H. W. WENZEL.
J. A. G. REHN.

PHILADELPHIA:
Entomological Rooms of
The Academy of Natural Sciences,
Logan Square.

1919.

The several numbers of the NEWS for 1919 were mailed at the Philadelphia Post Office as follows:

No. 1—January ..... January 4, 1919
" 2—February ..... January 31,
" 3—March ..... March 7
" 4—April ..... April 3
" 5—May ..... May 1
" 6—June ..... May 29
" 7—July ..... June 30
" 8—October ..... October 10
" 9—November ..... November 5

The date of mailing the December, 1919, number will be announced in the issue for January, 1920.

JANUARY, 1919.

ENTOMOLOGICAL NEWS

Vol. XXX. No. 1.

Thaddeus William Harris
1795-1856.

Smithsonian Institution
JAN 9 1919
National Museum

PHILIP P. CALVERT, Ph.D., Editor.
E. T. CRESSON, Jr., Associate Editor.

HENRY SKINNER, M.D., Sc.D., Editor Emeritus.

ADVISORY COMMITTEE:

EZRA T. CRESSON, PHILIP LAURENT, GEORGE M. GREENE, J. A. G. REHN, H. W. WENZEL.

PHILADELPHIA:
THE ACADEMY OF NATURAL SCIENCES,
LOGAN SQUARE.

Entered at the Philadelphia Post-Office as Second-Class Matter.
Acceptance for mailing at the special rate of postage provided in Section 1103,
Act of October 3, 1917, authorized on July 19, 1918.

ENTOMOLOGICAL NEWS

published monthly, **excepting August and September,** in charge of the Entomological Section of The Academy of Natural Sciences, Philadelphia, and The American Entomological Society.

ANNUAL SUBSCRIPTION, $2.00 IN ADVANCE.

SINGLE COPIES 24 CENTS.

ADVERTISING RATES: Full width of page. Payments in advance.

One issue,	one inch,	$ 1.20,	two inches,	$ 2.40,	half page,	$ 4.00,	full page, $ 8.00
Five issues,	"	5.50,	"	11.00,	"	17.50,	" 35.00
Ten issues	"	11.00,	"	20.00,	"	35.00,	" 70.00

☞All remittances, and communications regarding subscriptions, non-receipt of the NEWS or of reprints, and requests for sample copies, should be addressed to ENTOMOLOGICAL NEWS, 1900 Race Street, Philadelphia, Pa. *All Checks and Money Orders to be made payable to the* ENTOMOLOGICAL NEWS.

☞All complaints regarding non-receipt of issues of the NEWS should be presented within three months from date of mailing of the issue. After that time the numbers will be furnished only at the regular rate for single copies.

☞Not more than two issues will be replaced gratis through loss, in transit or in change of address, unless such have been registered, at the subscriber's expense.

☞Address all other communications to the editor, Dr. P. P. Calvert, Zoological Laboratory, University of Pennsylvania, Philadelphia, Pa., from September 15th to June 15th, or at the Academy of Natural Sciences, from June 15th to September 15th.

TO CONTRIBUTORS.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" for each number into the hands of the printer five weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form and without covers, will be given free, when they are wanted; if more than twenty-five copies are desired, this should be stated on the MS. The receipt of all papers will be acknowledged. Proof will be sent to authors for correction only when specially requested.

SPECIAL NOTICE TO AUTHORS

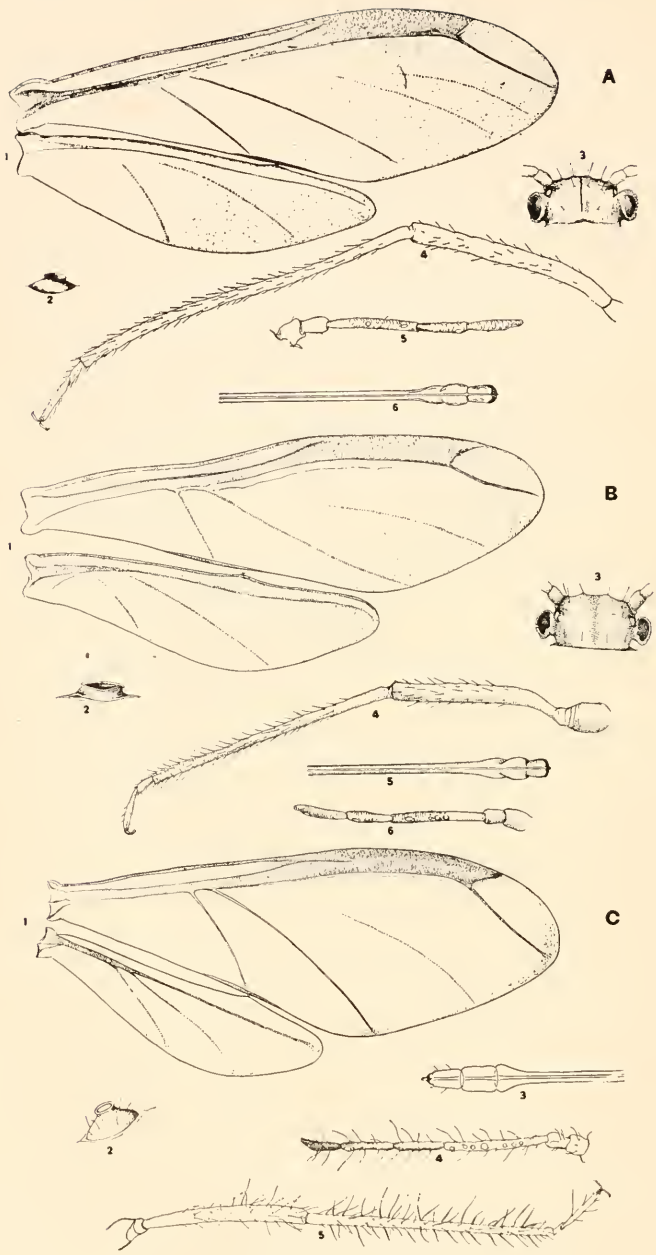
Owing to increased cost of labor and materials, no illustrations will be published in the NEWS during 1919, except where authors furnish the necessary blocks, or pay in advance the cost of making blocks, and pay for the cost of printing plates. Information as to the cost will be furnished in each case on application to the Editor. Blocks furnished or paid for by authors will, of course, be returned to authors, after publication, if desired.

☞ The printer of the NEWS will furnish reprints of articles over and above the twenty-five given free at the following rates: Each printed page or fraction thereof, twenty-five copies, 15 cents; each half tone plate, twenty-five copies, 20 cents; each plate of line cuts, twenty-five copies, 15 cents; greater numbers of copies will be at the corresponding multiples of these rates.

500 PIN-LABELS, 25 CENTS! All Alike on a Strip.

Smallest Type. Pure White Ledger Paper. Not Over 4 Lines or 30 Characters (13 to a Line)
Additional characters 1c. each, per Line, per 500, Trimmed.

C. V. BLACKBURN, 12 Pine St., STONEHAM, MASS., U. S. A.



LACHNIDS—WILSON.

A, ESSIGELLA CALIFORNICA; B, E. PINI; C, UNILACHNUS PARVUS.

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

THE ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XXX. JANUARY, 1919. NO. 1.

CONTENTS:

Wilson—Three new Lachnids with Comparative Notes on three others (Homop.) 1
Malloch—On an Undescribed Species Medeterus (Dipt., Dolichopodidae) 7
Howe—The Odonata of Concord, Massachusetts 10
Schwarz—On the Early Stages of Catocala titania Dodge, and a Description of Three new Varieties of Catocala (Lep.) 14
Cockerell—A new Genus of Bees from Peru (Hym.) 17
Alexander—Notes on the Genus Dicranoptycha Osten Sacken (Tipulidae, Diptera) 19
Cockerell—Cordulegaster dorsalis (Odonata) as an Enemy of Trout... 22
Editorial—The News for 1919 23
Cockerell—Bittacomorpha clavipes (Dipt.) 23
Becker—A One Year Life Cycle for Saperda candida Fab. Reared in an Apple (Col.) 24
Botanical Abstracts 25
Malloch—The Larval Habitat of Chalcomyia aerea Loew. (Diptera, Syrphidae) 25
Fall—A Change of Names (Coleoptera) 26
Howard—Note on the Vinegarone (Arach., Pedipalpi) 26
Weiss and Nicolay—Eumerus strigatus Fall, the Lunate Onion Fly, in New Jersey (Dip.) 27
Ferris—A Remarkable Case of Longevity in Insects (Hem., Hom.) 27
Entomological Literature 29

Three new Lachnids with Comparative Notes on three others (Homop.).

By H. F. WILSON, University of Wisconsin.*

(Plates I and II.)

Essigella californica (Essig). (Plate I, A, figs. 1-6.)

Description made from specimens collected on *Pseudotsuga douglassi* at Corvallis, and on *Pinus ponderosa?* at Grants Pass, Oregon, and from specimens sent to me by E. O. Essig, from California. They occur on the needles and are hidden by the sheath so that close observation is necessary to find them.

Apterous viviparous female. General color, a pale yellowish green to brownish yellow with a row of small brown dots on each body segment. A short sharp spine arises from each spot. Antennae and legs dusky brown. The body is elongate with the head and thorax quadrangular and the abdomen ovoid and ending in a sharp pointed cauda. The antennae are five-segmented and reach almost to the second pair of coxae. The third segment usually does not have sensoria, but in

*The drawings used in this paper were made by Mrs. Margaret Nehrlich Pickett, since deceased.

Smithsonian Institution JAN 9 1919

some specimens one or two may be present. The fourth segment has one large, and the fifth one large and several small sensoria. The rostrum reaches slightly beyond the third pair of coxae and has a very distinctive structure. Plate I, A, fig. 6. The third and fourth segments are quadrangular, while the fifth is but a small half moon-shaped piece closely attached to the fourth segment. The nectaries have a very small, narrow, cone-shaped base. The cauda is triangular and ends in a nipple-like projection. The legs and front part of the head are set with prominent long spline-like hairs. Length of body 2.2 mm.

Alate viviparous female. General color the same as in the apterous forms, except that the thoracic shield is deep brown and the head and prothorax are dusky brown. The body is elongate and slender, and the general shape and size of the antennae, beak, abdomen, nectaries and cauda are like those of the apterous forms, except the antennal sensoria on the third segment and the legs, which are longer and more slender in this form. The third antennal segment has two or three large circular sensoria, usually widely separated. The wings are long and slender, with the median vein once forked. The base of the fork is very indistinct and in some specimens cannot be distinguished. Each branch becomes more distinct towards the distal part.

Measurements. Length of body, 2.5 mm. Length of antennal segments, III, 0.187 mm.; IV, 0.1 mm.; V, 0.145 mm.; total length, 0.62 mm. Length of wing, 2.78 mm. Length of hind tibia, 1.34 mm.; hind tarsus, 0.1 mm. and 0.187 mm. Length of beak, 0.92 mm.

Essigella pini new species. (Plate I, B, figs. 1-6).

Description made from specimens collected on *Pinus virginiana,* by W. L. McAtee, at Plummers Island, Maryland, June 27 and 28, 1914. This species resembles very closely *Essigella californica* Essig, described from California, but several distinct differences are easily found. The main difference is found in the length and shape of the hind tibiae and the wings. The hind tibiae of *E. pini* are short and stout while those of *E. californica* are longer and slender. The wing of the former species normally has but a simple median vein, while the latter has normally two or more or less connected branches. Specimens in balsam. *Types* in writer's collection.

Apterous viviparous female. General color a light yellowish green, with a series of rows of small brown spots on the abdomen. The fore part of the body is quadrangular, while the abdomen tapers to a point. The antennae are five-segmented and of a peculiar shape, as shown in the accompanying drawing. The rostrum of this species and of *E. californica* are also quite distinct and are unlike that of any other

known species. The nectaries are small and without the large cone-shaped base found in most species of Lachnids. Length of body, 1.5 mm.

Alate viviparous female. The antennae are five-segmented, as shown in Plate I, B, fig. 6. General color, yellowish green, the thorax being brownish (?). The abdomen is marked with a series of brown spots which occur in longitudinal rows. The antennae are short and have five segments; distal half of the third and the fourth and fifth segments brown. The fifth segment is longer than the fourth, and the fourth and fifth together are slightly longer than the third; third segment with three and sometimes four roundish sensoria; fourth with one large one at the distal end, and the fifth with one large and several small ones near the tip. The head is set with coarse spines, six of which are set in front. Similar spines are found on the body. The antennae have a few inconspicuous spines widely set apart. The legs are distinctly spiny, but not as much so as in *Essigella californica*. The rostrum is short with the third and fourth segments quadrangular and the terminal segment half moon-shaped and not acutely pointed as in other species of *Lachninae*. Wings long and narrow, front wing usually with the median vein simple. The tibiae are short and rather stout, while in *E. californica* they are longer and more slender. The nectaries are but openings with thickened edges. The cauda is angular with the tip elongated into a sharp nipple-like projection.

Measurements. Length of body, 1.55 mm. Length of antennal segments, III, 0.21 mm.; IV, 0.1 mm.; V, 0.145 mm. Total length, 0.6 mm. Length of wing, 2.33 mm.; width, 0.9 mm. Length of beak, 0.64 mm. Length of hind tibia, 0.85 mm.; hind tarsus, 0.1 mm. and 0.145 mm.

Eulachnus thunbergii new species. (Plate II, D, figs. 1-8.)

Descriptions made from one male and six oviparous females mounted on slides in balsam. This material was secured for study through the kindness of Dr. L. O. Howard and Mr. A. C. Baker, of the United States Bureau of Entomology.

Original notes made by Mr. Theo. Pergande are as follows, "Pergande acc. 12127." "March, 1906. Received from Dr. I. S. Kuwana, of the Imperial Agricultural Experiment Station, Hishigahara, Tokio, Japan, alcoholic specimens of a Lachnid, marked 267, with the following note: On the twigs of *Sciadopytis verticillata* and *Pinus thunbergii* Parl. Tabata, Tokio, Nov. 25, 1905, winged form; II, head and antennae black, eyes red, Prothorax dark yellowish green, dorsal aspect of meso-metathorax, black; abdomen yellowish green. Honey tubes black; wingless form II, body yellowish green, long and narrow; head black; eyes reddish purple. Antennae dark yel-

low, but the tips black; honey tubes black. Mounted them in balsam. This appears to be a new species, near *L. agilis* Kaltenbach."

I have not seen specimens of *Eulachnus agilis* Kaltenbach which may or may not be the same as *Eulachnus rileyi* Williams, but I find this species to be distinctly different from Williams' species. *Types* in U. S. Bureau of Entomology collection.

The main differences are shown in the following comparisons between the two.

Oviparous Female	*Eulachnus rileyi*	*Eulachnus thunbergii*
Hairs	Coarse, spinelike	Fine. semi-setaceous
Antenna	1.22 mm. long	1.02 mm. long
Hind Tibia	1.78 mm. long	1.11 mm. long
Alate male	*Eulachnus rileyi*	*Eulachnus thunbergii*
Antenna	2 mm. long	1.53 mm. long
Hind Tibia	2.05 mm. long	1.33 mm. long
Sensoria	Numerous, small	Numerous, larger than in *E. rileyi*

Apterous oviparous female. Specimens in balsam appear to have about the same color and characteristics as *E. rileyi*? Color grayish brown. Antennae and legs dusky brown. Body elongate and furnished with long semi-spinelike hairs. Similar hairs occur on the antennae and legs. Beak short and extending to the hind coxae. The last segment is a narrow black piece without length and is hardly separated from the preceding segment. Antennae reaching slightly beyond the base of the hind coxae. Third antennal segment approximately as long as the fourth and fifth. The fifth slightly longer than fourth or sixth, the latter two being about equal. The fourth and fifth segments each bear a single sensorium near the distal end. Cornicles with the base hardly more than a millimeter in depth. Cauda short and broadly rounded. Hind tibia somewhat stout and with numerous small sensoria along the basal two-thirds.

Measurements. Length of body, 2.34 mm. Length of antennal segments, III, 0.378 mm.; IV, 0.16 mm.; V, 0.2 mm.; VI, 0.16 mm. Total length, 1.53 mm. Length of hind tibia, 1.11 mm.

Alate Male. General color, head and thorax black. Antennae and legs, except the middle parts of the first and second tibiae, deep brown. Genital plates dusky black. Cauda light colored. Hairs on antennae, legs and body as in the apterous forms. Body long and slender, antennae reaching beyond the hind coxae.

Antennae coarse and with numerous circular sensoria of irregular size. The fourth and fifth segments are about equal in length and are shorter than the third and longer than the sixth.

Nectaries as in the apterous forms. Wings long and narrow with median vein having but a single fork. Angle between branches wider and shorter than in *Eulachnus rileyi*.

Measurements. Length of body a little more than 2 mm. Length of antennal segments not definite because of a deformity in the only available specimen. III, 0.56 mm.; IV, 0.34 mm.; V, 0.34 mm.; VI, 0.26 mm. Length of hind tibia, 1.33 mm.

Eulachnus rileyi Williams. (Plate II, E, figs. 1-6.)

Description made from specimens sent to me by J. J. Davis, and from specimens collected at St. Louis, Missouri; Chicago, Illinois, and Madison, Wisconsin.

Apterous viviparous female. General color, orange brown to greenish black; the color is caused to vary more or less by a grayish pulverulence covering the body. When placed in balsam four rows of black spots are visible on the body, and from each one there arises a long spine-like hair. Antennae light at the base and shading to black at the tip. Antennae long and slender and quite spiny. The third segment is not quite as long as four and five together, segments four and six approximately equal. The rostrum is short, not quite reaching the hind coxae. The nectaries are small with a narrow cone-shaped base. Entire body covered with long spine-like hairs.

Length of body, 2.4 mm. Length of antennal segments, III, 0.45 mm.; IV, 0.24 mm.; V, 0.31 mm.; VI, 0.24 mm. Total length, 1.4 mm. Length of hind tibia, 1.6 mm.; hind tarsi, 0.12 mmm. and .22 mm.

Alate viviparous female. General color dark green or brown, covered with white waxy powder or threads. When mounted in balsam the head and thorax are brownish and the abdomen greenish brown. Antennae and hind pair of legs black, the tibia of the front pair of legs light colored except at the ends of the segment. Antennae long and slender and set with long black spine-like hairs. The third segment without sensoria, fourth and fifth with one each. Other characters as in apterous form.

Measurements. Length of body 2 mm. Length of antennal segments, III, 0.44 mm.; IV, 0.25 mm.; V, 0.26 mm.; VI, 0.19 mm. Total length, 1.3 mm. Length of hind tibia, 1.6 mm. Length of hind tarsus, 0.12 mm. and .22 mm.

UNILACHNUS new genus.

The characters upon which this genus is based are the unbranched median vein and blunt terminal segment of the ros-

trum. In the true genus *Lachnus* the terminal segment is long and tapering.

Type of genus *Lachnus parvus* Wilson.

Unilachnus parvus (Wilson). (Plate I, C, figs. 1-5).

This species is included in this paper to illustrate the genus and also to show the distinction between this and other species which have a simple or once forked median vein. A complete description will be found in Volume 41 of the Transactions of the American Entomological Society, 1915, p. 104. It occurs on the needles of *Pinus virginiana* and *P. rigida* and the type locality is the District of Columbia.

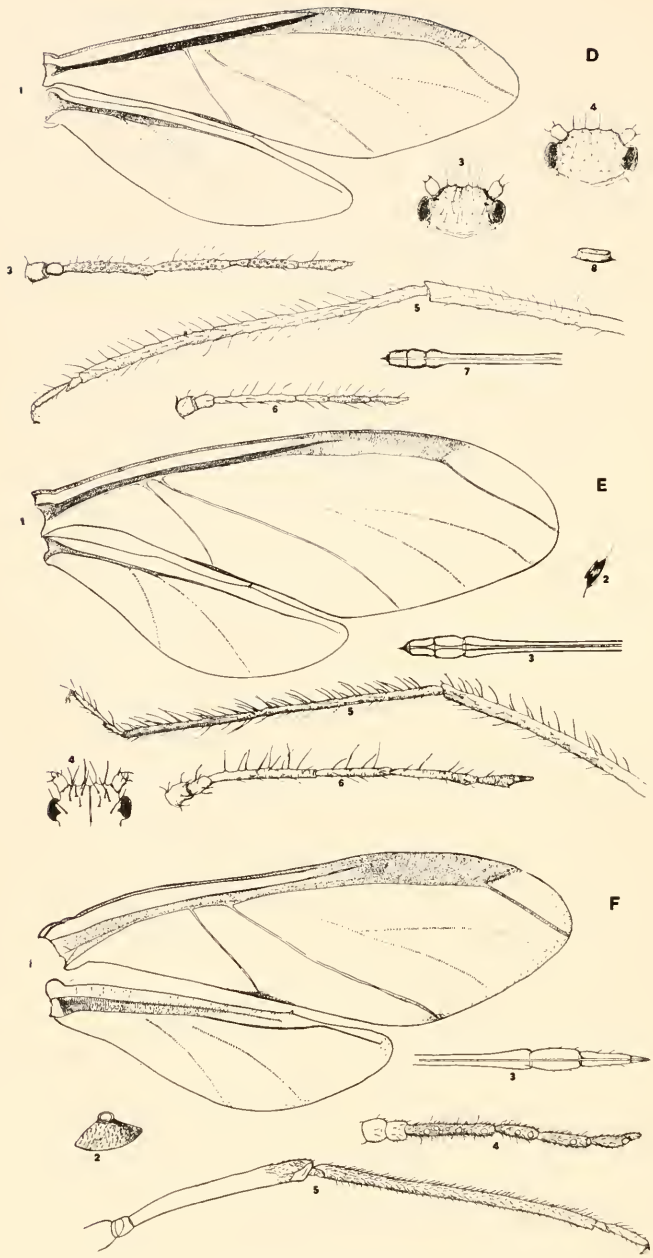
Alate viviparous female. Body elongate and slender, antennae and legs medium slender and thickly covered with long slender hairs. Antennae reaching to the third pair of coxae and the beak reaching to the second pair; beak broad and blunt at the tip. The third antennal segment bears about eight small sensoria, the fourth two and the fifth a single large one near the distal end; sixth with the usual large one near the base of the antennal spur. Wings hyaline and the median vein but a very indistinct single piece as indicated in the accompanying figure. Nectaries small and more or less bell-shaped. The opening rather large for the base. Cauda bluntly angled.

Measurements. Length of body, 1.48 mm.; width, 0.6 mm. Length of antennal segments, III, 0.32 mm.; IV, 0.154 mm.; V, 0.176 mm.; VI, 0.154 mm. Length of wing, 2.5 mm. Length of hind tibia, 0.92 mm. Length of hind tarsus, 0.066 mm. and 0.3 mm. Length of beak, 0.49 mm.

Lachnus juniperivora new species. (Plate II, F, figs. 1-5.)

From material collected by W. L. McAtee on Plummers Island, Maryland, July 5, 1914, on *Juniperinus virginiana*. *Types* in writer's collection.

Alate viviparous female. Specimens in balsam show no distinct coloration of antennae and legs, these parts appearing to be light dusky throughout. Third antennal segment approximately equal in length to the fourth and fifth segments, fourth segment shorter than the fifth, fifth and sixth about equal. Third segment with about six round sensoria of irregular size and not in alignment; fourth segment with two and fifth with two. Beak extending to the tip of the abdomen. The antennae are quite distinct from those of the other species in this genus and the nectaries are much broader at the base than those of *Lachnus tomentosus*. The wing venation is shown in Plate II, F, fig. 1. Nectaries with a wide sloping base. Cauda rounded, anal plate



LACHNIDS—WILSON.

D, EULACHNUS THUNBERGII; E, EU. RILEYI; F, LACHNUS JUNIPERIVORA.

angular. Antennae, legs and body with a moderate number of short medium hairs.

Measurements. Length of body, 1.8 mm. Length of antennal segments, III, 0.37 mm.; IV, 0.166 mm.; V, 0.187 mm.; VI, 0.187 mm. Total length, 1.02 mm. Beak, III, 0.21 mm.; IV, 0.21 mm.; V, 0.07 mm. Total length, 1.82 mm. Length of hind tibia, 1.36 mm.; hind tarsus, 0.083 mm. and 0.21 mm.

Explanation of Plates I and II.

Plate I.—A. *Essigella californica,* alate viviparous female; 1. wings; 2. cornicle; 3. head; 4. hind leg; 5. antenna; 6. rostrum.

B. *Essigella pini,* n. sp., alate viviparous female; 1, wings; 2. cornicle; 3. head; 4. hind leg; 5. rostrum; 6. antenna.

C. *Unilachnus parvus,* alate viviparous female; 1. wings; 2. cornicle; 3. rostrum; 4. antenna; 5. hind leg.

Plate II.—D. *Eulachnus thunbergii,* n. sp., 1. wing of male; 2. antenna of male; 3. head of male; 4. head of oviparous female; 5. leg of oviparous female; 6. antenna of oviparous female; 7. rostrum of male; 8. cornicle.

E. *Eulachnus rileyi,* alate viviparous female; 1. wings; 2. cornicle; 3. rostrum; 4. head; 5. hind leg; 6. antenna.

F. *Lachnus juniperivora,* n. sp., alate viviparous female; 1. wings; 2. cornicle; 3. rostrum; 4. antenna; 5. hind leg.

On an Undescribed Species of Medeterus (Diptera, Dolichopodidae).

J. R. Malloch, Urbana, Illinois.

In the June number of Entomological News for 1918 (p. 216) Mr. W. Marchand described the larva and pupa of *Argyra albicans* Loew, at the same time making some pertinent comments on the paucity of our knowledge of the life-history of the members of this family, and a suggestion that the "cyclorrhaphous" form of opening in the evacuated cocoon might indicate evolutionary relationships. Unfortunately the latter contention cannot be maintained by an examination of the facts. The cyclorrhaphous exit is produced by orthorrhaphous insects through a turning movement of the body, causing a cutting off of the cap of the cocoon through the abrasion by the sharp cephalic thorns of the material composing the cocoon. In Cyclorrhapha the ecdysis is facilitated by the expansion of the ptilinum on the

head of the enclosed imago, which presses against the cephalic extremity of the puparium, causing a rupture to take place along lines, or pseudosutures, previously existent. As a matter of fact the similarity between the cap-like lid left on the empty cocoon of species in Orthorrhapha and that of the other suborder on the puparium, which is merely the larval skin, is more imaginary than real, as the cap in the latter consists of at least 2, and often 4, distinct pieces. The cocoon of Orthorrhapha and the puparium of Cyclorrhapha are not identical in character, the former having no physiological relation to the insect, and to show evolutionary relationships it is essential that the same physiological features be compared.

In this paper I describe a new species of the genus *Medeterus*. Unfortunately no larvae were preserved as the specimens were merely side-products of another experiment. I have already recorded the fact that the imagines of one species at least of this genus in North America are predaceous. The larvae have the same habit.

Medeterus caerulescens sp. n.

♂ and ♀.—Metallic blue; frons, center of face, thorax and abdomen distinctly gray pruinescent. Antennae, palpi and proboscis black. Face deep blue, becoming violet-colored below antennae. Dorsum of thorax not distinctly vittate, the pruinescence most distinct in center anteriorly; pleura brighter blue than dorsum, especially below. Abdomen with a blue-green tinge; processes of hypopygium yellowish. Legs black, extreme apices of femora and bases of tibiae and basal half of midmetatarsus yellow. Wings clear, veins black, paler at bases. Postocular cilia white; bristle above fore coxa black; tegular cilia black. Halteres yellow.

♂.—Third antennal joint higher than long, with a slight indentation at insertion of arista, the latter very long, almost bare; face of equal width on its entire length; palpi with a few hairs. Dorsum of thorax with 2 rows of acrostichals on anterior half; scutellum with 2 strong apical and 2 weaker sub-basal bristles; propleural bristle short. Hypopygium long, reaching almost to base of venter, the processes slender. Fore tibia without bristles; mid tibia with the usual 2 bristles; basal joint of mid-tarsus nearly as long as joints 2 to 5 combined, the entire tarsus slightly longer than tibia; hind tibia rather thick, with weak hairs, which are most distinct on apical half of posterior surface, no

bristles present; basal joint of hind tarsus slightly over one-half as long as second, the latter about as long as joints 3 to 5 combined, the entire tarsus slightly longer than the tibia. Veins 3 and 4 convergent apically; outer cross-vein at about 1.5 its own length from apex of fifth vein.

♀.—Similar to the male in chaetotaxy; genitalia very slender. Length, 2.5 to 3 mm.

Type and *allotype*, White Heath, Illinois, April 19, 1918; larvae under bark of fallen cottonwood tree; imagines emerged April 26, 1918.

Closely resembles *maurus* Wheeler, but has black tegular cilia and differs in other respects.

The larva makes a cocoon similar to that of *Drapetis* but not so tough. The pupa is white, distinctly shining, with the cephalic thorns dark brown. The following notes indicate distinctions between this species and *Argyra albicans* Loew as described by Marchand.

The thoracic respiratory organs are more slender, the cephalic thorns are closely contiguous, with 2 long hairs at their bases above and 2 slight elevations ventrad of them, on each of which there is a long hair. The two protuberances referred to as converging bristles above the mouth-parts by Marchand are the apices of what I take to be the aristae, which are straight in *Medeterus*, the remainder of the antennae being clearly traceable to the bases of the cephalic tubercles. The wing-pads are longer in *Medeterus* than shown by Marchand, extending to base of third segment of abdomen; the position of the legs is similar in both species. The abdomen differs from that of *albicans* in having a series of long, sharply pointed, dense, appressed bristles on apices of segments 1 to 8 inclusive. In other respects the species are similar, except that *caerulescens* is only 3 mm. in length.

Imagines of *Medeterus* are nearly always found on the trunks of trees or on exposed vertical surfaces close to trees, while those of *Argyra* are found either on low vegetation or on bare sand close to streams. Both genera are common to Europe and North America.

The Odonata of Concord, Massachusetts.

By R. Heber Howe, Jr., Concord, Mass.

In Thoreau's "Summer" the following entries comprise the first records of dragon-flies for the township of Concord: "June 6, 1852.—First devil's needles in the air, and some bright green ones on flowers." "June 6, 1854.—I see some devil's needles, a brilliant green with white or black, or open work and black wings [*Libellula*?], some with clear black wings [*A. maculatum*?] some with white bodies and black wings, etc." [*P. lydia*?]. "June 10, 1857.—Many creatures, devil's needles, etc., cast their sloughs now." "June 14, 1853. p. m. To White's Pond—Large devil's needles [*Basiaeschna*?] are buzzing back and forth. They skim along the edge of the blue flags, apparently quite around this cove or further, like Hen Harries beating the bush for game." The first specific species recorded from Concord was *Celithemis elisa* listed by Dr. P. P. Calvert in Occasional Papers, Boston Society of Natural History, VII. Fauna of New England, 41, 1905, based on a specimen in the Academy of Natural Sciences of Philadelphia. The first list of local dragon flies was published by Edward L. Peirson, Jr., in the Proceedings of the Thoreau Museum of Natural History I:41, 1915, and numbered twelve species. The second, and a preliminary list was published by R. Heber Howe, Jr., in Psyche 23:12-15, 1916. This list contained fifty-two species. In a Manual of New England Odonata Memoir II, Part I, II & III March 1917-August 1917, July, 1918, 1-32, Thoreau Museum of Natural History, various Concord records appeared. The present list, probably nearly complete, numbers eighty-seven species. A complete collection of specimens on which these records are based is to be found in the Thoreau Museum of Natural History, Concord.

ZYGOPTERA.

Agrionidae.

Agrion aequabile (Say). Uncommon; Spencer brook, May 29 to June 24.

Agrion maculatum Beauv. Common; Spencer brook, Fairyland, May 20 to August 26.

Coenagrionidae.

Lestes congener Hagen. Uncommon; Willow pond (Carlisle) and adjacent ponds, August 19 to October 9.

Lestes disjunctus Selys. Rare; Willow pond region, August 14 to September 18.

Lestes eurinus Say. Rare; upper Spencer brook valley, Flaxdam pond (Wayland), June 5 to July 20.

Lestes forcipatus Ramb. Rather uncommon; Willow pond region, August 13 to September 7.

Lestes rectangularis Say. Uncommon; June 21 to September 18.

Lestes uncatus Kirby. Common; John Brown farm ponds, May 30 to June 27.

Lestes unguiculatus Hagen. Very common; ponds, brooks, etc., August 9 to September 5.

Lestes vigilax Hagen. Rather uncommon; Bateman's, Willow pond region, Sudbury river, August 5 to September 5.

Argia moesta (Hagen). Rare; Walden pond, June 16 to August 20.

Argia violacea (Hagen). Common; Fairhaven bay, Willow, Bateman's, Walden ponds, May to September 10.

Argia sedula (Hagen). Two tenerals taken on June 24, 1916, were of doubtful determination by Mr. E. B. Williamson.

Enallagma aspersum (Hagen). Rare; Willow, Bateman's, Goose ponds, August 13 to September 5.

Enallagma calverti Morse. Not uncommon; Fairhaven bay, Goose ponds, Spencer brook, May 19 to June 15.

Enallagma civile (Hagen). Common; river and ponds, May to September 10.

Enallagma ebrium (Hagen). Common; Fairyland, Willow, Bateman's ponds, May 26 to August 30.

Enallagma geminatum Kell. Common; Bateman's pond, July 20 to October 2. Taken by Mr. L. W. Swett in Bedford.

Enallagma hageni (Walsh). Rare; Spencer brook, June 8. Taken by Mr. L. W. Swett in Bedford.

Enallagma laterale Morse. Common; Bateman's pond, May to July 7.

Enallagma divagans Selys. Rare; Walden pond, June 19. Taken by Mr. Swett in Bedford.

Enallagma pollutum (Hagen). Common; Bateman's pond, June 23 to September 10. Taken by Mr. Swett in Bedford.

Enallagma signatum (Hagen). Common; Concord river, Bateman's pond, May 26 to September 5.

Enallagma traviatum Selys. Rather rare; Bateman's pond, August 1 to 20.

Nehalennia irene (Hagen). Rare; Willow, Strawberry Hill, Walden ponds, June 8 to September 7.

Chromagrion conditum (Hagen). Uncommon; Fairyland, Bateman's, Walden ponds, June 4 to 23.

Ischnura posita (Hagen). Very rare; June 16 to September 3.

Ischnura verticalis (Say). Common; Willow and Goose ponds, May 29 to October 9.

Anomalagrion hastatum (Say). Rare; Goose, Strawberry Hill and Willow ponds, August 13 to 19.

ANISOPTERA.

Aeshnidae.

Cordulegaster diastatops (Selys). Uncommon; Bateman's, John Brown farm brooks, May 28 to June 18.

Cordulegaster maculatus Selys. Uncommon; Spencer, John Brown farm brook, June 8 to 28.

Hagenius brevistylus Selys. Rare; Walden, Bateman's, Willow ponds, August 16 to September 3.

Ophiogomphus aspersus Morse. Rare; Bateman's pond, Spencer brook, May 26 to June 11.

Gomphus borealis Needh. One female, Bateman's pond, May, 1915, collected by Peirson.

Gomphus exilis Selys. Common; Bateman's, Walden ponds, Spencer brook, May 30 to August 8.

Gomphus spicatus Hagen. Common; Bateman's, Walden ponds, May 13 to June 23.

Gomphus spiniceps (Walsh). One specimen recorded by Peirson.

Gomphus furcifer Hagen. Rare; Strawberry Hill pond, June 9 to 11. Taken by Dr. N. Banks at Lexington, June, 1917.

Dromogomphus spinosus Selys. Uncommon; Bateman's, Willow ponds, July to September 8.

Boyeria vinosa (Say). Uncommon; Spencer brook, John Brown farm brook, August 23 to September 15.

Basiaeschna janata (Say). Common; Spencer brook, Bateman's, Walden ponds, May 17 to June 24.

Gomphaeschna furcillata (Say). Rare; Bateman's pond, June 7-8. Recorded by Peirson in May.

Anax junius (Drury). Common; Goose, John Brown farm, Bateman's, Willow ponds, May 18 to September 19.

Aeshna canadensis Walk. Common; Bateman's, Willow ponds, August 8 to September 27.

Aeshna clepsydra Say. Common; Concord river, Willow pond, August 19 to October 9.

Aeshna constricta Say. Uncommon; Willow, Bateman's ponds, August 19 to September 26.

Aeshna eremita Scud. Concord, October 1.

Aeshna tuberculifera Walk. Rare; Strawberry Hill pond, August 11 to September 6.

Aeshna umbrosa Walk. Common; August 15 to October 26.
Aeshna verticalis Hagen. Common; August 15 to October 2.
Epiaeschna heros (Fabr.). Rare; Bateman's pond, June 7. Recorded by Peirson in May.

LIBELLULIDAE.

Didymops transversa (Say). Common; Bateman's, Willow, Walden ponds, May 17 to June 23.
Epicordulia princeps (Hagen). Common; Bateman's pond, May 25 to August 29.
Helocordulia uhleri (Selys). Rare; Willow, Bateman's pond, Spencer brook, May 17 to June 18.
Tetragoneuria cynosura (Say). Abundant; May 3 to June 26.
Tetragoneuria cynosura var. simulans Mutt. Uncommon; Bateman's pond, May 28 to June 23.
Tetragoneuria morio Mutt. Rare; Bateman's pond, May 26 to 29.
Tetragoneuria spinigera Selys. Uncommon; Bateman's pond, May 19 to June 18.
Dorocordulia libera (Selys). Rare; Bateman's pond, June 8-9.
Dorocordulia lepida (Hagen). Rare; Bateman's pond, August 9 to 13.
Williamsonia lintneri (Hagen). Rare; Bateman's and Willow pond, May 16 to June 1. Recorded by Peirson.
Cordulia shurtleffi Scud. Rare; Bateman's pond, June 9-27, and Flaxdam pond, Wayland.
Somatochlora kennedyi E. M. Walker. Common; Bateman's pond, upper Spencer brook, June 3 to 24.
Somatochlora tenebrosa (Say). Rare; Bateman's pond, September 8.
Somatochlora walshii (Scudder). Rare; a male found floating on the Assabet River on September 15, 1918, by H. M. Keyes.
Libellula cyanea Fabr. Uncommon; Willow and Bateman's pond, June 4 to September 4.
Libellula exusta (Say). Common; May 19 to July.
Libellula flavida Ramb. Rare; Fairyland, August 14.
Libellula incesta Hagen. Abundant; June 6 to September 17.
Libellula luctuosa Burm. Common; Bateman's, Fairyland ponds, June 16 to August 19.
Libellula pulchella Drury. Abundant; June 6 to September 8.
Libellula quadrimaculata Linn. Common; Walden, Goose, Bateman's, Strawberry Hill ponds, May 19 to August 19.
Libellula semifasciata Burm. Rare; John Brown farm, Strawberry Hill pond, June 9 to August 22.
Plathemis lydia (Drury). Common; May 27 to September 3.
Perithemis domitia var. tenera (Say). Common; Bateman's, John Brown farm ponds, July to September 5.

Erythemis simplicicollis (Say). Uncommon; Concord river, July to September 3.

Sympetrum costiferum (Hagen). Rare; Willow, Bateman's pond, August 15 to September 26.

Sympetrum rubicundulum (Say). Abundant; June 9 to September 30.

Sympetrum rubicundulum var. **obtrusum** (Hagen). Rare; September 5 to October 5.

Sympetrum semicinctum (Say). Common; Bateman's, Willow ponds, July 25 to September 18.

Sympetrum vicinum (Hagen). Common; August 14 to November 7.

Pachydiplax longipennis Burm. Common; Bateman's, Willow ponds, Fairhaven bay, July 28 to September 9.

Leucorrhinia frigida Hagen. Rare; Willow, Strawberry Hill ponds, June 8 to August 19.

Leucorrhinia glacialis Hagen. Uncommon; Fairyland, Willow, Walden, Goose, Strawberry Hill ponds, May 19 to June 21.

Leucorrhinia intacta Hagen. Common; May 17 to June 28.

Celithemis elisa (Hagen). Common; Willow, Walden ponds, Spencer brook, May 19 to June 18.

Celithemis eponina (Drury). Common; Bateman's, John Brown farm ponds, July to September 3.

Tramea carolina (Linn.). Rare; Strawberry Hill pond, June 8 to 11.

On the Early Stages of Catocala titania Dodge, and a Description of Three New Varieties of Catocala (Lep.).

By Ernst Schwarz, St. Louis, Missouri.

Catocala titania.

Ovum.—Glossy emerald green, changing in about ten days to liver brown; rather flat, concave ventrally; 42 to 48 ribs, many crossribs. Micropyle area rather large, granulated with many hexagonal elevations; micropyle slightly raised. Shortly before hatching the color changes to transparent blue.

Larva, Stage 1.—Head large; sides of head light brown. Body tapering to the sixth segment, from there enlarging; body color transparent bluish. Setae on first four segments only, whitish; three rows of dark brown tubercles on dorsal portion, each bearing a black spine. Ventral faintly pinkish with the usual blotches dark brown.

Stage 2.—Head smaller than in stage 1; brown. First and second segments a shade lighter than the rest of the body, which is a watery green color; two lateral lines a shade darker than body color. Dorsal

bears three rows of brownish tubercles, each set with a single spine; the saddle is faintly marked, with no elevation. Ventral as in stage 1.

Stage 3.—Head bilobed, ashen color; a black band below crest. Crest reddish, a black longitudinal dash in inverted "V" space. Body color faintly pinkish, thickly dotted with black, so that the general aspect is brownish gray. There is a faint middorsal line; the three rows of tubercles are tipped with orange, as is also the blunt elevation on saddle above third pair of prolegs. Spiracles black surrounded by the body color. Setae pinkish, short and are not present between segments nine and ten. Ventral light pinkish, with blotches of light blue.

Stage 4.—Head is body size; color and markings as in stage 3. Hump above third pair of prolegs is more prominent; setae pinkish, short and stout.

Stage 5.—Head strongly bilobed; posterior part brown, darkest at cleft; sides marbled with liver color; two black transverse bands in inverted "V" space. Crest orange, from which protrudes a tubercle of light orange set with a black spine. Body color greenish ashen sprinkled with many minute black dots; no distinct lines; all tubercles tipped with orange. Hump on saddle is prominent, brown tipped with reddish, and of a very fine texture; a second hump about half the size of the first and inclined toward it is on the same segment; dark brown, setae pinkish, stout. Ventral pinkish, with blotches of dark blue.

Pupa has no distinctive features from the *Catocala* type.

The larvae of *C. titania* can be collected until May 19, by bush beating night or day, as they do not leave the top of the tree for resting. When grown, the larva is easily recognized by the double horn above the third pair of prolegs; the posterior one is much the smaller, about half the size of the anterior.

The behavior of the larva of *C. titania* varies but little from that of other species of the genus. During the first stage they do not leave the margin of the leaf upon which they feed; in the second stage they rest on the lower surface of the midrib of the leaf; in the third stage they rest on a twig just a little larger in diameter than the body, and continue so during the remaining stages. They seem to be comfortable only when resting on a branch a little thicker than themselves, in either an upright or a horizontal position. Pupation occurs in most instances amid the thick foliage of a tree.

In every stage the caterpillar mimics the color of its rest-

ing-place: this gives the organism almost certain protection. In a previous article* on the habits of *C. titania,* I have mentioned that the imago rests in its similarly-colored environment in perfect confidence of safety and cannot easily be alarmed. Thus we see that throughout all the stages of its life cycle, this species is protectively colored.

Catocala titania Dodge, n. var. **distincta.**

Primaries.—Ground color whitish gray, sprinkled with brown spots of various shades; lines all prominent. T. a. line doubled, the anterior part faint, the posterior prominent throughout its entire length, but most conspicuous on costal region; median shade prominent, joins anteriorly the reniform. T. p. line very much in evidence, mostly so at "M" and sinus at vein 1. Reniform concolorous with subterminal line; subreniform closed, a shade lighter than ground color. Subterminal space dark brown, merging costally in the ground color; subterminal whitish and prominent; terminal line brownish but faint. In all other respects as in the type. Expanse 39 mm.

Types: One male and one female in collection of the author. *Paratype*: One male in collection of R. Lange. *Habitat*: St. Louis, Missouri.

In general aspect, this variety resembles *C. alabama,* except that the forewings of the former are much the narrower.

Catocala minuta Edwards, n. var. **eureka.**

♀.—Thorax silvery gray; body yellow, concolorous with hind wings; basal portion to b. h. line concolorous with thorax; from this point to subterminal line the primaries are blackish brown; all markings in this space very obscure; subterminal space very prominent, silvery white; terminal space light gray; lunula blackish, centered with silvery dots; fringes concolorous with terminal space. Expanse 38 mm.

♂.—The terminal space not so prominent as in the female; in all other respects as in the female.

Habitat: St. Louis, Missouri.

Types: One male and one female in author's collection. *Paratypes*: One male and one female in collection of Fred. T. Naumann, of St. Louis, Mo. The females and one male bred by Mr. F. Naumann; the other male taken by the writer.

Eureka is to *minuta* what the variety *gisela* is to *micronympha,* and *scintillans* is to *innubens.*

* Ent. News, 27: 68.

Catocala minuta Edwards, n. var. **obliterata.**

♂ and ♀.—Forewings so heavily overlaid with blackish scales as almost to obscure the ground color and markings, except the ring surrounding the black reniform center, which is light brown, and subterminal line at costa, which is also light brown. Hind wings as in *minuta,* with the exception of the absence of the yellow apical patch. Expanse 40 m.m.

Habitat: St. Louis, Missouri.

Types: Collection of the author.

This variety bears the same relation to *minuta* as *agatha* to *unijuga*, and *lydia* to *faustina*, and *somnus* to *luciana.*

A New Genus of Bees from Peru (Hym.).

By T. D. A. Cockerell, Boulder, Colorado.

Among the Old World Halictine bees is a very singular genus, *Thrinchostoma* of Saussure; first described from Madagascar, but now known to be widely distributed in tropical Africa and Asia.* The species have the mouth region prolonged and more or less snout-like, the malar space large. The wings are hairy, and in the males there is a patch of black hair situated on the second transverso-cubital nervure. There is a hyaline fold or spurious vein extending from the base of the stigma obliquely across the first submarginal cell and across the lower part of the second. The abdomen is subclavate, especially in the males. The tongue is long and slender.

At Huascaray, Peru, September 21, 1911, Prof. C. H. T. Townsend collected a very peculiar bee, having the aspect of a male *Thrinchostoma,* but with slender simple hind legs, and no patch of black hair on the second transverso-cubital nervure. Closer inspection shows it to be a female, and as it is wholly without pollen-collecting apparatus it must be a parasitic insect. It is thus quite distinct from *Thrinchostoma* and it is an interesting question whether it represents an isolated group of an old Thrinchostomine stock, or an independent evolution of parallel characteristics. It represents in any event a genus new to our classification, though it has in fact been provided

* See Canadian Entomologist, Feb., 1913, p. 35; July, 1915, p. 213. Ann. Mag. Nat. Hist., Dec., 1914, p. 452.

with a generic name. Vachal, in Miscellanea Entomologica, xii (1904), p. 127, described a species *Halictus chlerogas,* from a female taken at Callanga, Peru. It is considerably smaller than our species, and metallic green but it is evidently congeneric. Vachal, struck by its peculiar characters, surmises that it may represent a new parasitic genus and adds that if this should prove to be the case the genus might be named *Chlerogas,* and the species *C. latitans.* According to the rules, however, it will be *Chlerogas chlerogas* (Vachal).

CHLEROGAS Vachal.

Halictine bees without pollen-collecting apparatus in the female, the abdomen of this sex clavate, truncate and hirsute at apex, without any caudal rima; hind legs of female long and slender, the tarsus much longer than tibia or femur; no hind patella; hind spur with three long teeth; head prolonged beyond the eyes, snout-like, malar space very large; inner orbital margins deeply emarginate; ocelli ordinary; antennae long for a female; scutellum binodose; wings conspicuously hairy; basal nervure falling short of transverso-median; second submarginal cell nearly square, first recurrent nervure meeting second transverso-cubital on entering extreme base of the large third submarginal cell; stigma large. Type *C. chlerogas,* but also includes:

Chlerogas hirsutipennis n. sp.

♀.—Length about 12 mm., anterior wing nearly 11; face prolonged about 1.3 mm. beyond eyes; head and thorax black, not metallic; labrum, mandibles and apical margin of clypeus dull yellow; clypeus dull with sparse very feeble punctures; antennae black, flagellum and apex of scape obscure, reddish beneath; face, vertex, mesothorax and scutellum with thin black hair; hair of metathorax thin, erect, ochreous; mesothorax dull, without evident punctures; area of metathorax with extremely fine oblique striae; posterior truncation of metathorax long, oblique, narrow, with a median sulcus, only the lower end defined on each side by a carina; tegulae dark reddish; wings dusky, stigma honey-color, nervures dilute fuscous; legs bright ferruginous; abdomen piceous above, dull, without bands, base of second segment pale reddish; apex with coarse black hair; second and third ventral segments light ferruginous.

Huascaray, Peru; type in U. S. Nat. Museum.

Notes on the Genus Dicranoptycha Osten Sacken (Tipulidae, Diptera).

By Charles P. Alexander, Lawrence, Kansas.

The genus *Dicranoptycha* was erected by Osten Sacken in 1859 to include four closely allied crane-flies from the eastern states. In 1910, Coquillett designated the first of these four species, *D. germana,* as the genotype. Later on, in the *Monographs* (1869), Osten Sacken relegated *D. sororcula* to the synonymy of *D. sobrina,* where it still remains. Besides the four valid Nearctic species, there are two European species of the genus. The Oriental *D. signaticollis* v.d.W. is undoubtedly a *Libnotes* rather than a *Dicranoptycha.* The known species of the genus are all very closely related and are separable only on slight differences of color and structure.

Of the American species, *D. germana* O. S., the largest form, is characteristic of the Canadian life-zone and its range rarely overlaps those of the other species. The three remaining forms, together with the two species described in this paper, are characteristic of the Austral and lower Transitional life-zones. They frequent open woods, often but not necessarily near water, and several species may be found flying together. Thus at Plummer's Island, Maryland, in July, 1915, Mr. McAtee and the writer found *D. sobrina* and *D. winnemana* commonly. At Lawrence, Kansas, in July and August, three species fly commonly at the same time, *D. winnemana, D. minima* and *D. tigrina.* These species appear on the wing in about the order given, *D. winnemana* emerging first in early June, *D. minima* in early July and *D. tigrina* in mid-July, though all three species continue on the wing throughout August and most of September. They frequent the open Austral woodlands such as North Hollow on the University Campus and in such situations may be found resting on the leaves of tall herbage and low shrubbery. They are almost invariably the only Limnobiinae occurring but fly with a number of species of *Tipula* which have a much shorter flight period (*Tipula dietziana, T. mingwe, T. morrisoni, T. unimaculata, T. umbrosa, T. flavoumbrosa, T. flavibasis,* etc.).

The general distribution of the American species has been indicated by the writer in an earlier paper (Proc. Acad. Nat. Sci., Phila., 1916, pp. 496, 497). All of the species are comparatively restricted in distribution excepting *D. sobrina.* In the *Monographs* (1869, p. 117) Osten Sacken stated that the Californian specimens represented a new species which he did not characterize. In his *Western Diptera* (1877, pp. 197, 198),

however, he indicated that the species was very probably *D. sobrina*. I have examined a great number of specimens from the western states and must state that I cannot distinguish the material from typical eastern *sobrina* and so must consider this species as being trans-continental, the widest distribution for any species of the genus. Specimens from New Mexico break this rather discontinuous range of *sobrina* and the species may be looked for in Texas and other intermediate states. *D. nigripes* is still known only from the unique type taken in Georgia. Specimens that were distributed by me under this name are herein described as a new species, *D. minima*. *D. winnemana*, described from Plummer's Island, Maryland, ranges from Maryland and Georgia westward to Kansas. The new species described below have as yet been found only in scattered localities in Douglas County, Kansas, but unquestionably have a wide range in this section.

The larvae of the species that I have reared, *D. winnemana* and *D. minima*, are very similar to one another and are very characteristic in appearance. They are unusually elongate, slender, the body terete; the skin very thin, glassy, entirely transparent, and glabrous so that the head-capsule and contents of the alimentary tract show through as clearly as through a very thin glass. The head-capsule is of the massive Limnobiine type and is readily told from all other crane-flies with the exception of *Epiphragma* by the three-toothed mentum. The spiracular-disk is comparatively small, surrounded by four small, slender, pointed lobes, two being lateral and two ventral in position. The inner face of these lobes and the disk itself are variously marked with black lines. The anal swelling is fleshy and highly protuberant. The larvae live in the moist or rather dry earth where they occur beneath the surface layer of leaf-mold and other debris. The pupa is likewise very characteristic since it apparently lacks pronotal breathing horns, these being sessile as in the higher Diptera. The pupa lives encased in a small, oval case of earth. The above observations were made on material reared by my wife, Mabel M. Alexander. Detailed observations on the immature stages of this interesting genus are given in another paper.

A Key to the American species of Dicranoptycha.

1. Wings with a strong reddish-brown or fulvous tinge; *Rs* notably longer than cell 1*st M2*; Canadian life-zone. (Northeastern United States).....*germana* O. S.
   Wings not strongly fulvous; *Rs* approximately as long as cell 1*st M2*; Austral and Transitional life-zones.....2
2. Tips of the femora conspicuously black; abdominal tergites uniformly light brown or yellow.....3

Tips of the femora not black; abdominal tergites banded or at least the seventh segment blackish.....4

3. Size large (male, length, about 10 mm.); wings brownish yellow; male hypopygium with the gonapophyses acicular, prominent. (Georgia). .....*nigripes* O. S.
Size small (male, length, under 8 mm.); wings brown; male hypopygium with the gonapophyses small, not projecting. (Kansas). ..... **minima**, sp. n.

4. Coloration yellow, the wings deep yellowish. (Eastern United States). .....*winnemana* Alex.
Coloration brown or gray; wings pale brownish or grayish. 5

5. Abdominal tergites uniformly dark brown or only the seventh segment darker; male hypopygium with the gonapophyses not acicular or projecting. (United States).....*sobrina* O. S.
Abdominal tergites banded, tigrine in appearance, the apical third of each segment pale; male hypopygium with the gonapophyses acicular, prominent. (Kansas). ..... **tigrina**, sp. n.

Dicranoptycha tigrina, sp. n.

♂.—Length, 9 mm.; wing, 9.8-10 mm. ♀.—Length, 10 mm.; wing, 9.3-9.5 mm.

Rostrum reddish. Palpi black. Antennae with the scape reddish yellow, the flagellum black. Head grayish brown, the vertex narrow.

Mesonotum dark brown with a sparse brownish yellow pollen and without distinct stripes. Pleura clear gray becoming more yellowish below. Halteres pale. Legs with the coxae brownish yellow, the anterior coxae darker brown; femora brownish yellow, the tips of the femora darker brown; tibiae and tarsi brown. Wings with a strong gray tinge, highly iridescent; veins dark brown. Venation: *Sc* moderately elongated, extending to about midlength of the basal deflection of *R*4+5; *Rs* moderately elongated, about as long as the long cell 1*st M*2 and half again as long as the deflection of *R*4+5; basal deflection of *Cu*1 inserted at or before one-third the length of cell 1*st M*2.

Abdominal tergites dark brown, the apical third of each segment more yellowish, producing a banded or tigrine appearance; segment seven dark brownish black; hypopygium reddish yellow. Sternites similar but the pale posterior margins to the segments are still broader. Male hypopygium with the dorsal pleural appendage bent at a right angle before midlength, the long apical point provided with numerous setae; ventral pleural appendage a short, broad, flattened blade, with a short curved tip and the inner margin with 8 or 9 acute serrations. Gonapophyses long, acicular, projecting conspicuously between the pleurites.

Habitat: Kansas.

Holotype, ♂, Lawrence, Douglas County, Kansas, alt. 900 ft., July 16, 1918. *Allotopotype*, ♀. *Paratopotypes*, 50 ♂ ♀, July 16-30, 1918.

This species is apparently close to *D. nigripes* O. S. in the structure of the male hypopygium but the coloration of the wings and body are very different.

Dicranoptycha minima, sp. n.

♂.—Length, 6.7-7.2 mm.; wing, 6.5-7.8 mm. ♀.—Length, about 6.5 mm.; wing, 7-7.2 mm.

Rostrum brownish yellow. Palpi black. Antennae with the scape

bright yellow, the flagellum brownish black. Head brown; vertex rather broad.

Pronotum grayish brown. Mesonotum light brown without stripes; pseudosutural foveae distinct, black. Dorsal pleurites indistinctly grayish, the ventral pleurites yellow. Halteres brown. Legs with the coxae and trochanters yellow; femora dull yellow, the tips narrowly and abruptly blackened; tibiae yellowish brown, the extreme bases and tips a little darkened; tarsi brown, the metatarsi more yellowish. Wings with a strong brownish tinge, more yellowish basally and along the costa; veins dark brown, subcosta yellow. Venation about as in *D. tigrina.*

Abdomen yellowish brown without distinct darker markings; tergite seven concolorous with the other abdominal segments. Hypopygium yellowish. Male hypopygium with the dorsal pleural appendage flattened, very broad, the surface covered with setae. The narrow ventral appendage is produced into a long slender apical point. Gonapophyses short, not acicular or projecting conspicuously between the pleurites.

Habitat: Kansas.

Holotype, ♂, Lawrence, Douglas County, Kansas, alt. 900 ft., July 16, 1918. *Allotopotype*, ♀. *Paratopotypes*, 50 ♂ ♀.

The types of the new species are in the collection of the author. Paratypes have been placed in the leading collections of the country.

Cordulegaster dorsalis (Odonata) as an Enemy of Trout.

Mr. Frank Springer writes from the Abbott Ranch, Rito de los Frijoles, New Mexico, Sept. 1, as follows:

"I am sending you some beasties, that I should like to know a little more about. They are highly predaceous devils, and I first discovered them in the act of seizing some of 'a lot of young trout which I was placing in the brook here. The bug lies buried in mud or sand, in shallow parts of the stream where the current is not very swift, with only his eyes projecting. When a little fish (about an inch long) comes wiggling along close enough over the bug, he snaps, projecting his formidable mandibles [lateral labial lobes] and the shovel-like part below them for quite a distance to the front, and catches the fish by his wiggling tail. By simulating the wiggling motion of a fish with a knife-blade, I could induce the bug to snap at it, and thus saw the motion several times. . . . . I found the creatures quite numerous in the shallow, quieter waters where I was planting the young fry, and apparently they constitute a rather serious menace to the stocking of the stream, as they infest the shallow places, while the deeper water is dangerous on account of the older fish. I find that the trout eat these bugs to some extent, as in several instances they were contained in the stomach, and they are readily taken when offered as bait."

Specimens sent agree in all particulars with *Cordulegaster dorsalis* Hagen, as described and figured by Needham.—T. D. A. Cockerell, Boulder, Colorado.

ENTOMOLOGICAL NEWS.

PHILADELPHIA, PA., JANUARY, 1919.

The News for 1919.

Whether the hopes for the betterment of Entomology expressed in our editorial for November last are any farther toward realization may well be doubted. In one respect, affecting the NEWS very strongly, it is certain that conditions are worse than at any time in the past. We regret to say that increased charges for labor within the last few months, unaccompanied by any decrease in other expenses, positively compel us to reduce the number of pages which we are able to publish each month and to forego all illustrations in plate or text, except where authors bear their cost. Even with these curtailments we look forward to a considerable deficit at the end of 1919. We surely owe this statement of our outlook for the new year to our many friends and contributors when they open the pages of the present number and note its smaller size. It is unnecessary to say that they can not regret this condition more than do the editors and committees of the NEWS. Whenever financial matters improve, we shall respond at the earliest possible moment by restoring this journal to its former thickness.

Bittacomorpha clavipes (Dipt.).

On Sept. 1, as I was crossing a road in Boulder, Colorado, I saw a strange apparition. What seemed to be a series of black and white specks, symmetrically arranged, was passing rapidly through the air. I realized at once that I was looking at *Bittacomorpha clavipes,* which I had never before met with in my years of collecting at Boulder. Having no net, I could only knock it down with my hat, breaking off the strange and beautiful legs. This is not the first capture of *B. clavipes* in Colorado, as Mr. C. P. Alexander informs me that Dr. F. H. Snow took it in Manitou Park, in August, years ago. The group is an ancient one, now represented by comparatively few species, scattered over the earth. A species of the same genus (*B. miocenica* Ckll., 1910) has been found fossil in the miocene shales at Florissant.—T. D. COCKERELL, Boulder, Colorado.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

A One Year Life Cycle for Saperda candida Fab. Reared in an Apple (Col.).

In Bulletin No. 156 of the Arkansas Agricultural Experiment Station the writer called attention to the fact that it seemed quite probable that *Saperda candida* could be reared through all of its stages in the fruit of apple. At the time of the writing of the above mentioned bulletin the writer had in rearing two larvae which were at that time nearly one year old. The eggs from which these larvae had hatched had been deposited in an apple by a beetle during the season of 1917.

The eggs hatched in this apple, and the larvae were allowed to burrow around in the fruit until it began to decay, after which each larva was transferred to a fresh fruit. The borers were transferred to fresh fruits whenever the condition of the latter made it necessary to do so. During the winter the apple containing the insects was kept in the laboratory so that temperature conditions were favorable for them all the year.

Reared in this way, one larva pupated and emerged as an adult in the summer of 1918, which was just one year after the egg from which it hatched, had been deposited. During the course of their development larvae were fed upon all sizes of apples, ranging from young green fruits not much over one and one-half inches in diameter to fully ripened and matured fruits. Part of the time the borers fed upon soft and rotten fruits. The larva which matured in the fruit had probably fed upon six different apples during the course of its development.

It is possible, in fact quite likely, that the unfavorable conditions under which the larvae were reared, were responsible for the development of one of them in one year. The beetle which developed from this larva was only about 15 mm. long, whereas a normal beetle is usually from 18 to 20 mm. in length. The second larva died at about the time when the first one pupated. It seems most likely that the second larva died because of the condition of the apple at the time of its death. The latter was in the same soft and rotten condition as the apple in which the first larva pupated.

In view of the rapid and apparently normal development of the larvae up until winter of their first year, it seems quite likely that they would attain their normal development in the fruit if they were given fresh material from time to time so that the medium in which they were feeding would not become soft, gelatinous and even liquid as was the case many times in the apples in which we reared our larvae.—Geo. G. Becker, Arkansas Agricultural Experiment Station, Fayetteville, Arkansas.

Botanical Abstracts.

Under this title there has appeared No. 1, Vol. I, dated September, 1918, of "a monthly serial furnishing abstracts and citations of publications in the international field of botany in its broadest sense. . . . The Board of Control of Botanical Abstracts has charge of the publication. With the beginning of the year 1919, the membership of the Board of Control will be representative of the [13] various American botanical societies. At that time each society will be represented by two members, one elected for a period of two years and the other for a period of four years. After January, 1919, each society will elect a member for a period of four years, at intervals of two years, to replace its representative who automatically retires." It is planned to issue two volumes of 300 pages each within one year, at $6.00 for the two volumes. This first number bears on its cover the names of an editor-in-chief and 15 editors for different divisions of botany with others still to be announced. As Entomology is so closely linked with Botany this magazine will be very useful to those cultivating the former. Indeed so "broad" is the "sense" of botany interpreted that we find in this number summaries of articles whose content is zoological or entomological and not botanical, e. g., "Inheritance in Orthoptera," "A preliminary report on some genetic experiments concerning evolution" [largely concerned with the gypsy moth], "Studies in inheritance in the hybrid Philosamia (Attacus) ricini (Boisd.) ♂ Philosamia cynthia (Drury) ♀." The publishers are the Williams and Wilkins Co. of Baltimore.

The Larval Habitat of Chalcomyia aerea Loew. (Diptera, Syrphidae).

On March 4 Dr. R. D. Glasgow brought to me a number of larvae of the above species which he had found in a dead basswood log at Augerville Woods near Urbana. Along with these were several larvae of the tipulid *Xiphura fumipennis* O. S., and one of *Xylota fraudulosa* Loew. On March 13 the latter produced an imago, and on March 14 two males of *aerea* appeared.

The only record of the larval habitat of the latter is that published by Metcalf in his "Syrphidae of Ohio." His record states that a pupa was found under the bark of a log lying close to a river and whether the larva had gone there to pupate or had lived in the log was left in doubt. The larvae very closely resemble those of *Eristalis*, possessing a long slender tail-like caudal respiratory appendage, but the log in which the specimens before me were found was not supersaturated and as *Xylota fraudulosa* does not possess a long caudal appendage it is difficult to explain the relation between the structure of *Chalcomyia* larva and its habitat.—J. R. Malloch, Urbana, Illinois.

A Change of Names (Coleoptera).

Thanks to the courtesy of Mr. C. W. Leng, my attention has been called to a number of pre-occupied names used by me in recent descriptive work. These, with the new names now proposed, are as follows:

For *Bledius dissimilis* Fall (Trans. Am. Ent. Soc. 1910, p. 107)
Substitute *B. philadelphicus* new name.

For *Bledius fratellus* Fall (loc. cit. p. 112)
Substitute *B. transitus* new name.

For *Pachybrachys instabilis* Fall (Trans. Am. Ent. Soc. 1915, p. 471)
Substitute *P. hector* new name.

H. C. Fall, Tyngsboro, Massachusetts.

Note on the Vinegarone (Arach., Pedipalpi).

Professor Comstock, in his Spider Book, concerning the giant whip-tail scorpion (*Mastigoproctus giganteus*), writes, "In some parts of the South they bear the local name *grampus* and are greatly feared on account of their supposed venomous powers; but it is probable that there is no foundation for this fear; for although it has been stated often that their bites are poisonous, I can find no direct evidence that this is true, and no poison glands have been found in this order."

Many years ago, when the late Dr. George Marx was connected with the United States Department of Agriculture, he kept one or more specimens of this dangerous looking creature in a glass jar in the laboratory of the Division of Entomology and made a careful study of its possibility for harm, but both experimentally and by dissection failed to find any basis for the common superstition. For a long time it was a standing joke in the Division of Entomology to test the nerves of occasional visitors by inviting them to handle one of these specimens. I remember that no less a person than that excellent entomologist, John B. Smith, refused absolutely to touch one, while those of us who knew handled them with impunity.

As is well known, the name *vinegarone* in the southern United States was originally given by French settlers from the French West Indies, and arose from the vinegar-like, intensely acid secretion which the whip-tail scorpion exudes when approached.

An interesting story was told me the other night at the Biological Society of Washington by General T. E. Wilcox, to the effect that in 1877 at Camp Supply, Indian Territory, a blacksmith crushed a *vinegarone* on his upper left breast. Blisters resulted which extended over the whole breast, and the glands were involved to some extent. He stayed away from work for a week, and General Wilcox, who at that time was a surgeon in the Army, treated him. Of course there was no sting, and the blisters resulted simply from the acid secretion.—L. O. Howard, U. S. Bureau of Entomology, Washington, D. C.

Eumerus strigatus Fall., the Lunate Onion Fly, in New Jersey (Dip.).

On February 6, 1918, an adult of this European species, kindly identified by Dr. Bequaert, was taken in a greenhouse at Rutherford, New Jersey. This is the first definite record of its occurrence in New Jersey, but its presence was suspected several years ago in connection with iris roots injured by *Macronoctua onusta* Grote (Psyche, June, 1915, p. 106). Felt (27th Rept. State Ent., N. Y., p. 119) records it from Saratoga Springs, New York, and states that Dr. Chittenden informed him that it had been bred from bulbs received from Connecticut and Texas. Its presence in New Jersey at Rutherford is not surprising in view of the fact that huge quantities of Holland bulbs are consigned to this locality every year. In "Ziekten en Beschadigingen der Tuinbouwgewassen," by Van Den Broek en Schenk, it is listed as a pest of narcissus in Holland and it is stated that it and *Merodon equestris* constitute the most important insect enemies of that plant.

According to the Dutch authors, the flies appear in May and June and the eggs are evidently laid on the bases of the leaves. The larvae enter the nose of the bulb, from 10 to 30 being found in a single one. When full grown they are from 7 to 9 mm. in length. The maggots feed in the interior, which soon becomes slimy and decayed and the destruction appears to be more complete and rapid than that caused by *Merodon equestris* larvae with which they are sometimes associated in the same bulb. The puparia are usually found in the outside layers, or at the nose of the bulb, during August and it appears that a second brood of flies, of which little is known, appears in September and October. On bright, sunny days the adults can be seen flying low over the narcissus plants. It is also recorded as attacking hyacinths and onions. In Holland the destruction of infested bulbs appears to be the common method of control.

Verrall (British Flies, 8, 615, 1901) states that it is recorded from all North and Middle Europe and Italy, and Walker (1851, Insecta Britannica, Diptera, I, 241-42) records it as being generally distributed in Great Britain and states that the larvae of the genus feed on bulbous roots. Considering the fact that it was first noted in the United States in 1906 (Chittenden), it is strange that more records of it have not turned up. On account of its reputation as an onion pest in Europe its presence in this country should be of interest, especially in such states as Ohio, New York, Texas, California, Indiana, Illinois, Louisiana, Massachusetts, Kentucky and New Jersey, which are the ten main onion States in the order of their importance.—H. B. Weiss and A. S. Nicolay, New Brunswick, New Jersey.

A Remarkable Case of Longevity in Insects (Hem., Hom.)

The genus *Margarodes* (Hemiptera, Coccidae) contains certain curious species in which the first stage larva possesses legs and antennae, these appendages being lost in the intermediate stages and reappearing in the adult. All of the described species are subterranean in habitat and in all the appendageless, intermediate stages are enclosed within a tough, hard cyst formed from the secretions of certain dermal glands of the insect. The details of the life histories of most of the species are unknown but one species, *M. vitium* Giard, has received a considerable amount of attention.

This species is a native of Chile and Venezuela, where it feeds upon roots of grapes and at times becomes somewhat of a pest. It has been the subject of a number of more or less extended papers and in one of these Mayet[1] has recorded the astonishing fact that adults were observed by him to issue from cysts that had been kept for a period of seven years, during which time the insects had taken no food. The emergence of the adult was induced by immersing the cysts in water for a considerable period. Apparently this ability to lie dormant for long periods is an adaptation to the peculiarities of the climate of the insect's native land, the adult insects emerging normally during the rainy season. Some one has said that in certain parts of Chile it rains but once in seven years and sometimes skips this.

The Stanford collection of Coccidae contains several cysts of this species, collected in Chile by Lataste and received by the University from Professor Cockerell in 1902. In December of 1917 several of these cysts were opened by the present writer, the enclosed individuals being found dead and shriveled as was to be expected. However, the insect removed from one cyst was so soft and white as to induce the belief that it must still be alive. There being no appendages the movement of which might reveal the presence of life, histological preparations were made from the specimen.

These preparations have been examined by competent authorities, including Professors F. M. McFarland and Harold Heath, all of whom agree that the specimen must have been alive at the time it was removed from the cyst or at the most but a very short time before. The tissues appear in all respects to be perfectly normal, the nuclei of the hypodermal cells and of the walls of the alimentary canal not differing in any recognizable degree from those of the same organs seen in preparations of other Coccids known to have been alive at the time of fixation. Astonishing as this may seem, there is no reasonable explanation other than that the insect was indeed alive.

Correspondence with Professor Cockerell has elicited the information that the material from which this specimen was taken came into his hands in 1899 or 1900 or perhaps earlier. When they were collected is not known, nor, of course, is it known how old they were when they were collected. *There is, however, the definite and indisputable record that this insect remained alive for at least 17 years without food.*

It would be most interesting to know whether the insect could still have transformed into an adult and issued from the cyst under the stimulus of moisture. Unfortunately all the remaining cysts contain only specimens that are unmistakably dead and shriveled and the opportunity is past.—G. F. Ferris, Stanford University, California.

[1]Mayet, V. Note sur Margarodes vitium Giard. Bull. Soc. Ent. France (7), 6, p. 50. 1896.

Entomological Literature.

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded.

The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of papers containing new species are all grouped at the end of each Order of which they treat. Unless mentioned in the title, the number of the new species occurring north of Mexico is given at end of title, within brackets.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

4—Canadian Entomologist, London, Can. **10**—Proceedings of the Entomological Society of Washington, D. C. **11**—Annals and Magazine of Natural History, London. **13**—Journal of Entomology and Zoology, Claremont, Calif. **16**—The Lepidopterist, Salem, Mass. **17**—Lepidoptera, Boston, Mass. **18**—Ottawa Naturalist, Ottawa, Can. **51**—Archiv fur Mikroskopische Anatomie, Bonn. **52**—Zoologischer Anzeiger, Leipsic. **53**—Nature Study Review, Ithaca, N. Y. **54**—Proceedings of the Biological Society of Washington, D. C. **55**—Bulletin de la Societe Vaudoise des Sciences Naturelles, Lausanne, Switzerl. **56**—Proceedings of the Indiana Academy of Sciences, Indianapolis. **57**—Biologisches Zentralblatt, Leipzig. **58**—New York State Museum Bulletin, Albany. **59**—Journal of Agricultural Research, Washington. **60**—Maine Agricultural Experiment Station, Orono. **68**—Science, Lancaster, Pa.

GENERAL. Dewitz, J.—Ueber kunstliche aufhebung des spinnens der arthropoden. **52,** I, 27-30. **Escherich, K.**—Zeitschrift fur angewandte entomologie. Band iv, Heft i, 188 pp. **Felt, E. P.**—Key to American insect galls. **58,** 200, 310 pp. **Harris, H. W.**—Field notes. **17,** ii, 86.

GENETICS. Cromwell, H.—Further experiments with the mutant, scarlet, from Drosophila repleta. **56,** 1917, 287-93. **Zeleny, C.**—Germinal changes in the bar-eyed race of Drosophila during the course of selection for facet number. **56,** 1917, 73-7.

ARACHNIDA AND MYRIAPODA. Pillichody, A.—Photographie d'une toile d'araignee. **55,** lii, 157-60.

Chamberlin, R. V.—Two new diplopods from Louisiana. **4,** 1918, 361-3.

NEUROPTERA. Ballowitz, E.—Ueber die samenkorper der Libellen. 1. Die spermien und spermiozeugmen der Aeschniden. **51,** Abt. 1, xc, 169-85. **Darsie, D. L.**—A list of Odonata chiefly from Laguna beach. **13,** x, 79.

Walker, E. M.—On the American representatives of Somatochlora arctica with descriptions of two n. sps. **4**, 1918, 365-75.

ORTHOPTERA. Caudell, A. N.—Zorotypus hubbardi, a n. sp. of the order Zoraptera from U. S. **4**, 1918, 375-81. Two n. sps. of the blattid genus Arenivaga. **10**, xx, 154-7.

HEMIPTERA. Riley, C. F. C.—Food of aquatic Hemiptera. **68**, xlviii, 545-7. **Jones & Gillette**—Life history of Pemphigus populi-transversus. **59**, xiv, 577-94. **McAtee, W. L.**—Genera of the Eupterygidae (Jassoidea). **54**, xxxi, 109-24.

McAtee, W. L.—Notes on Nova Scotian Eupteryid leaf-hoppers, including descriptions of two n. sps. **4**, 1918, 360-1.

LEPIDOPTERA. Acker, C. T.—The study of moths and butterflies as a recreation. **53**, xiv, 337-43. **Ainslie, C. N.**—A note on the economic importance of Samia cecropia. **10**, xx, 150-2. **Barnes & McDunnough**—Illustrations of the N. Am. sps. of the genus Catocala. (Mem. Am. Mus. N. H., n. s., iii, pt. 1, 47 pp.) **Dognin, P.**—Heteroceres nouveaux de l'Amerique du Sud. Fasc. xiv, 27 pp. **Ehrmann, G. A.**—New exotic [neotropical] papilios. **17**, ii, 82-4. **Hiser, O. F. & J. S.**—Life history of Catocala nuptialis. **16**, ii, 66-9. **Prout, L. B.**—New L. in the Joicey collection [S. Am]. **11**, ii, 412-18. **Rowley, R. R.**—A long-fasting lepidopter. **4**, 1918, 363-4.

DIPTERA. Greene, C. T.—Note on the habits of Pegomyia affinis and other anthomyid genera. **10**, xx, 160. **Lindner, H.**—Ueber die mundwerkzeuge einiger dipteren und ihre beziehungen zur ernahrungsweise. **52**, I, 19-27.

Alexander, C. P.—New [5] nearctic crane flies. **4**, 1918, 381-6.

COLEOPTERA. Hudson, C. H.—Concerted flashing of fireflies. **68**, xlviii, 573-5.

Chapin, E. A.—A new Hydnocera (Cleridae). **54**, xxxi, 107-8. **Swaine, J. M.**—Canadian bark-beetles. Part 2. [8 new]. (Canada, Dept. Agr., Ent. Branch. Bul. 14.). **Woods, W. C.**—The biology of Maine species of Altica [3 new]. **60**, Bul. 273.

HYMENOPTERA. Cockerell, T. D. A.—Descriptions and records of bees [Neotropical]. **11**, ii. 418-25. **Cushman, R. A.**—Notes on the cocoon spinning habits of two sps. of Braconids. **10**, xx, 133-6. **Henning, H.**—Zur ameisenpsychologie. Ein kritische erorterung uber die grundlagen der tierpsychologie. **57**, xxxviii, 208-20. **Rohwer, S. A.**—North American species of the sawfly genus Laurentia. **10**, xx, 157-9. **Sladen, F. W. L.**—The genus Vespa in Canada. **18**, xxxii, 71-72. **White, G. F.**—Note on the muscular coat of the ventriculus of the honey bee. **10**, xx, 152-4.

Gahan, A. B.—A synopsis of the species belonging to the chalcidoid genus Rileya [4 new]. **10**, xx, 136-50.

The NEWS for December, 1918, was mailed at the Philadelphia Post Office on December 14, 1918.

List of Coleoptera of North America

By CHARLES W. LENG

TO BE PUBLISHED IN THE SPRING OF 1919, PROVIDED 500 PAID SUBSCRIPTIONS ARE OBTAINED BEFORE FEBRUARY 1st

---

This long needed work has now been completed, and the untiring and painstaking efforts of Mr. Leng have resulted in a book which will be indispensable to all those interested in this Order of insects.

The main features are briefly these :—

I. Complete list of the species, varieties and synonyms, about 30,000 in all, together with page reference to the place in which each was originally described, and also an indication of distribution—the whole arranged in genera, tribes and families, according to recent systems of classification. The species are numbered in the usual manner for the convenience of those desiring it.

II. Complete list of all works containing original descriptions of North American species, from 1758 to the end of 1918.

III. Complete list of the Fossil species of North America, prepared by Professor H. F. Wickham.

These three divisions of the book will require about 400 pages of text.

The book will be the size of Col. Casey's "Memoirs of Coleoptera," about 7 x 10 inches, the text printed two columns to the page, with some marginal space for annotations, which may be made in ink, if desired.

The subscription price has been fixed at the lowest possible amount to encourage all who are interested to subscribe at once, and in this way insure early publication of the book. In order to bring about this result, it will be necessary for all subscribers able to do so to take two or more copies.

PRICE, UNBOUND, INCLUDING DELIVERY, FIVE DOLLARS AND FIFTY CENTS
PRINTED ON ONE SIDE ONLY, SEVEN DOLLARS
PAYABLE IN ADVANCE IN ALL CASES

Owing to the high cost and scarcity of paper and labor, it is not practicable to print a large edition, and the price will have to be materially increased upon publication.

SEND ALL SUBSCRIPTIONS AND REMITTANCES TO THE PUBLISHER

JOHN D. SHERMAN, Jr.

24 Claremont Avenue, Mount Vernon, New York

NEW ARRIVALS

From Columbia, So. America:

OVER 10,000 BUTTERFLIES, INCLUDING

Morpho cypris
" sulkowskyi
Morpho amathonte
Caligo spp.

From Cuba:

1500 BUTTERFLIES AND MOTHS, INCLUDING

Papilio columbus
" andraemon
" celadon
" devilliersi
Urania boisduvali
Erinyis guttalaris
Protoparce brontes, etc.

From Venezuela:

Over 5000 Lepidoptera
200 Dynastes hercules

From New Guinea:

2000 Coleoptera
200 Orthoptera

From Assam, India:

1200 BUTTERFLIES AND MOTHS, INCLUDING

Papilio arcturus
" philoxenus
Kallima inachis
Brahmaea wallachi

And Many Other Showy Species

From Tibet (Bhutan)

Armandia lidderdalii
Parnassius hardwicki

CATALOGUES OF ENTOMOLOGICAL SUPPLIES AND SPECIMENS ON APPLICATION

If interested kindly send your list of desiderata for further information to

THE KNY-SCHEERER CORPORATION

Department of Natural Science
G. Lagai, Ph.D.

New York
404-410 W. 27th Street

FEBRUARY, 1919.

ENTOMOLOGICAL NEWS

Vol. XXX. No. 2.

Thaddeus William Harris
1795-1856.

Smithsonian Institution
FEB 3 1919
National Museum

PHILIP P. CALVERT, Ph.D., Editor.
E. T. CRESSON, Jr., Associate Editor.

HENRY SKINNER, M.D., Sc.D., Editor Emeritus.

ADVISORY COMMITTEE:

EZRA T. CRESSON, PHILIP LAURENT, GEORGE M. GREENE, J. A. G. REHN, H. W. WENZEL.

PHILADELPHIA:
THE ACADEMY OF NATURAL SCIENCES,
LOGAN SQUARE.

Entered at the Philadelphia Post-Office as Second-Class Matter.
Acceptance for mailing at the special rate of postage provided in Section 1103,
Act of October 3, 1917, authorized on July 19, 1918.

ENTOMOLOGICAL NEWS

published monthly, **excepting August and September,** in charge of the Entomological Section of The Academy of Natural Sciences, Philadelphia, and The American Entomological Society.

ANNUAL SUBSCRIPTION, $2.00 IN ADVANCE.

SINGLE COPIES 24 CENTS.

ADVERTISING RATES: Full width of page. Payments in advance.

One issue,	one inch,	$ 1.20,	two inches,	$ 2.40,	half page,	$ 4.00,	full page, $ 8.00
Five issues,	"	5.50,	"	11.00,	"	17.50,	" 35.00
Ten issues	"	11.00,	"	20.00,	"	35.00,	" 70.00

☞ All remittances, and communications regarding subscriptions, non-receipt of the NEWS or of reprints, and requests for sample copies, should be addressed to ENTOMOLOGICAL NEWS, 1900 Race Street, Philadelphia, Pa. *All Checks and Money Orders to be made payable to the* ENTOMOLOGICAL NEWS.

☞ All complaints regarding non-receipt of issues of the NEWS should be presented within three months from date of mailing of the issue. After that time the numbers will be furnished only at the regular rate for single copies.

☞ Not more than two issues will be replaced gratis through loss, in transit or in change of address, unless such have been registered, at the subscriber's expense.

☞ Address all other communications to the editor, Dr. P. P. Calvert, Zoological Laboratory, University of Pennsylvania, Philadelphia, Pa., from September 15th to June 15th, or at the Academy of Natural Sciences, from June 15th to September 15th.

TO CONTRIBUTORS.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" for each number into the hands of the printer five weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form and without covers, will be given free, when they are wanted; if more than twenty-five copies are desired, this should be stated on the MS. The receipt of all papers will be acknowledged. Proof will be sent to authors for correction only when specially requested.

SPECIAL NOTICE TO AUTHORS

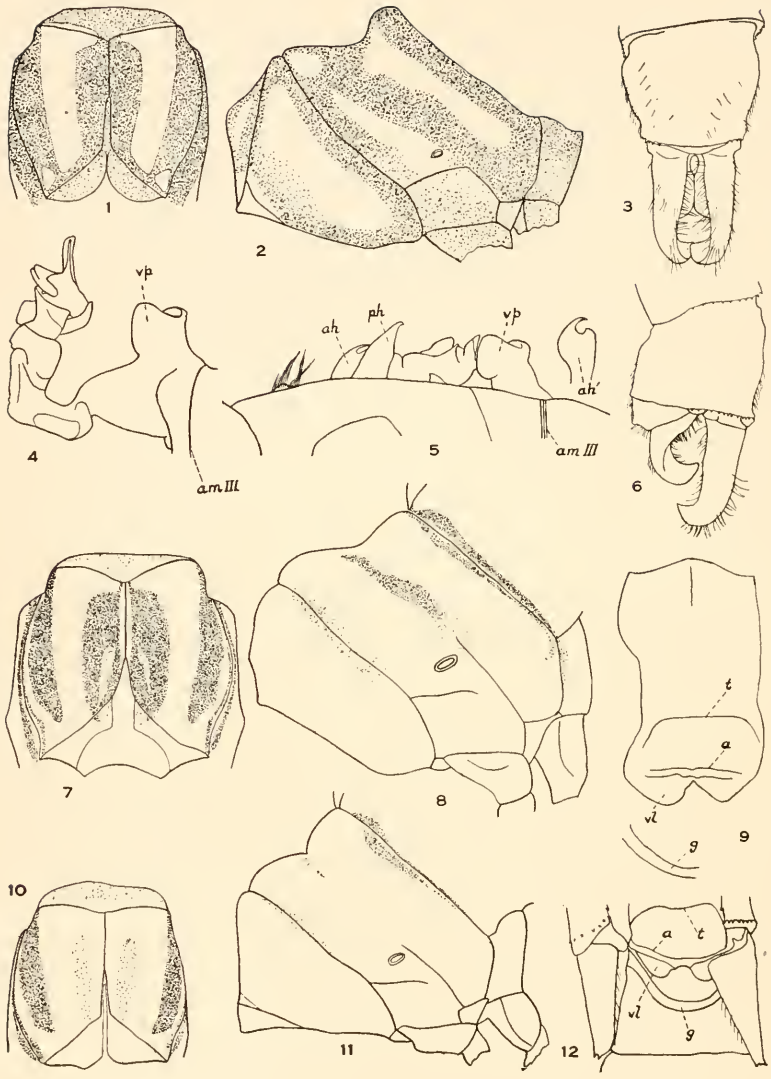
Owing to increased cost of labor and materials, no illustrations will be published in the NEWS during 1919, except where authors furnish the necessary blocks, or pay in advance the cost of making blocks, and pay for the cost of printing plates. Information as to the cost will be furnished in each case on application to the Editor. Blocks furnished or paid for by authors will, of course, be returned to authors, after publication, if desired.

☞ The printer of the NEWS will furnish reprints of articles over and above the twenty-five given free at the following rates: Each printed page or fraction thereof, twenty-five copies, 15 cents; each half tone plate, twenty-five copies, 20 cents; each plate of line cuts, twenty-five copies, 15 cents; greater numbers of copies will be at the corresponding multiples of these rates.

500 PIN-LABELS, 25 CENTS! All Alike on a Strip.

Smallest Type. Pure White Ledger Paper. Not Over 4 Lines or 30 Characters (13 to a Line)
Additional characters 1c. each, per Line, per 500, Trimmed.

C. V. BLACKBURN, 12 Pine St., STONEHAM, MASS., U. S. A.



ODONATA ANISOPTERA FROM GUATEMALA.—CALVERT.

1-6, ERPETOGOMPHUS SCHAUSI; 7-9, E. DIADOPHIS, PARATYPE; 10-12, E. DIADOPHIS?, CAYUGA ♀.

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

THE ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

Smithsonian Institution FEB 3 1919 National Museum

VOL. XXX. FEBRUARY, 1919. NO. 2.

CONTENTS:

Calvert—Odonata Anisoptera from Guatemala ... 31
Stoner—Swarming of the Monarch Butterfly in Iowa (Lep.) ... 38
Wilson and Davis—A New Genus and Species of Aphid (Hem., Hom.) ... 39
Cockerell—Neocorynura, a Genus of Halictine Bees (Hym.) ... 41
Crampton—Notes on the Phylogeny of the Orthoptera ... 42
Skinner—A few hours on Mt. Washington (Lepid.) ... 48
Editorial—Entomology at the Convocation Week Meetings ... 49
Entomological Literature ... 50
Review of Prof. Carlos E. Porter's Collector's Manual in Spanish ... 53
Review—Washburn's Injurious Insects and Useful Birds ... 54
Review—Rau's Wasp Studies Afield ... 54
Doings of Societies—Ent. Sec., Acad. Nat. Sci. of Phila ... 56
American Entomological Society ... 56
Feldman Collecting Social ... 58
Obituary—Victor Arthur Erich Daecke 58

Odonata Anisoptera from Guatemala

Collected by Messrs. William Schaus and John T. Barnes.

By PHILIP P. CALVERT, University of Pennsylvania, Philadelphia, Pa.

(Plate III)

Messrs. Schaus and Barnes, whose extensive collecting of Lepidoptera in Guiana, Mexico and Costa Rica is well known, turned their energies to Guatemala in February, 1915, remaining in that country until April, 1918. During that period they sent to me from time to time a number of Odonata which add to our knowledge of the fauna of Guatemala over and above that recorded in the Neuroptera volume of the *Biologia Centrali-Americana*. I have listed them, following the order of the species in the Biologia and occasionally adding some descriptive matter. Mr. Schaus made some notes on the fresh colors of some of the specimens and these I have enclosed in quotation marks. He has also given me data on some of the more unfamiliar localities at which they took Odonata, as follows:

Caballo Blanco, "13 miles beyond Retalhuleu on the branch line to Champerico; it consists of grazing country with a little vegetation along the rivers, but no forest near at hand, and the soil is humid and very fertile."

Cayuga, 23.4 miles from Puerto Barrios and a little west of Tenedores. A farm house recently abandoned was fitted up by the United Fruit Company and placed at their disposal; it was their Guatemalan headquarters. "The house stands on a hill by itself, 150 feet above the railway and river, with the most glorious views in every direction. The chief veranda faces the south with the winding [Motagua] river threading through thousands of acres of bananas, limited by virgin forests, and with the mountains of Honduras in the distance; to the north we are close to forest clad hills and almost all my day collecting is along [their] trails and streams. The elevation of the [railway] station is 107 feet and the forest ridge about 400 feet higher. The hills....on the south side are covered with dense tropical forest, no pines at all." On October 7, 1915, he wrote: "I cannot understand why with the heat and rain there are not more things flying." On April 30, 1917: "The conditions here (climatic) are still disastrous and not an insect is to be seen except a few wasps. Not a drop of rain has fallen since I last wrote and all the weeds around the place are dead and dried up and there are extensive forest fires, fanned into energy by strong easterly gales which blow all afternoon and evening.'

Chejel, in Baja Vera Paz, eleven miles from Tucurú, elevation 3100 feet. "I have had five weeks at Chejel, where I have been visiting most charming friends" [in June, etc., 1917].

Iguana, "a flag station, 72.3 miles from Barrios, elevation 493 feet, and at the beginning of the dry section of the Motagua valley; the country is hilly, with scattered pines and swampy in places. We only went there once for a few hours and found your Odonata flying in the wet places."

Joaquina, "a flag station, 170 miles from Barrios, elevation 2269 feet; a dry district owing to steep mountains with muddy ditches along track in rainy season, little vegetation and some 200 feet above river. We were delayed there several hours by a land-slide, so I put my net on and caught a few insects."

Montufar, "44 miles from Barrios (Motagua valley)."

Oneida, "Motagua valley near Morales, 25 miles from Barrios, elevation 300 feet."

Polochic River. Writing Aug. 17, 1917: "I am still in Vera Paz..... since a week I have worked every night with my lamp until 3 A. M. Barnes is doing the day work and rides nine miles down the mountains to the Polochic River and gets in several hours' collecting."

Purulhá "is the correct spelling, not Purula, as Champion spells it."

In the letter just quoted: "I have had.....three weeks at Purulhá."

Quirigua "is 57.4 miles from Barrios, elevation 240 feet, and is in the humid banana district. The Motagua valley is very broad there, with hills on the south side covered with forest of poor growth, chiefly pines and the manaca palms; there are small streams in all the valleys. The forest in the main valley has all been cleared by the Fruit Co." In their first year in Guatemala they had a month or six weeks at Quirigua before going to Cayuga.

San Felipe, "in the department of Retalhuleu, elevation 2056 feet, surrounded by sugar cane and coffee plantations."

Santa Maria, Volcano, department of Quezaltenango, elevation 5500 feet.

Tactic, Baja Vera Paz; "ten days in Tactic" (Aug. 17, 1917).

GOMPHINAE.

Gomphoides elongata Selys. Gualan, August, 1 ♂.

Very close to the only male of *elongata* which is available for comparison, viz., from Guadalajara, Jalisco, Mexico, July, by Schumann, listed in the Biologia volume, page 157. This Gualan male is smaller (abdomen 43.5, hind wing 31 mm.), less robust, the lateral margins of abdominal segments 8 and 9 are less dilated, that of 9 less angulate, angle distinctly rounded, superior anteapical angulation of the superior appendages also rounded.

Gomphoides suasa suasa Selys. Cayuga, May, 1917, 1 ♂. Quirigua, forest, June 25, 1 ♂, 1 ♀.

Erpetogomphus schausi n. sp. (Pl. III, figs. 1-6).

Purulhá, forest stream, July 7, 1 ♂, *type*, in the writer's collection at the Academy of Natural Sciences of Philadelphia.

♂. Black or blackish brown, the following bright green: greater part of the frons (except its postero-dorsal and antero-ventral margins), the rhinarium, a transverse streak on the middle of the free margin of the labrum, the greater (anterior) part of the fore prothoracic lobe, anterior margin of the propleuron, the greater part of the transverse dorsal mesothoracic ridge (but not where it joins the mid-dorsal carina or the humeral suture), an antehumeral stripe separating the dark submedian and antehumeral stripes, increasing in width cephalad and ventrad and confluent with the green of the transverse mesothoracic ridge just mentioned (at mid-height this green antehumeral stripe is a little wider than half of the dark submedian and narrower than the dark antehumeral stripe), a rounded triangular spot just below the antealar sinus and anterior to the humeral suture,

almost confluent with the upper end of the green antehumeral stripe (this spot apparently represents the upper end of an otherwise obsolete pale humeral stripe), a mesepimeral stripe wider above, a rounded superior spot and an inferior stripe on the metepisternum, a wider stripe on the metepimeron (each of these three sclerites being margined with black on all sides, but the postero-ventral angle of the metepimeron is green), and the dorsal interalar sclerites. (Pl. III, figs. 1, 2.)

Mandibles, maxillae and labium buff, but the apices of the first two and of the median and lateral labial lobes black.

Ventral thoracic surface dull greenish with pruinose traces in the depressions.

Abdomen blackish-brown, its pale markings evidently faded, such as are visible being the sides of 1 inferiorly, the auricles, a postero-ventral spot and possibly a mid-dorsal stripe on 2, a mid-dorsal basal stripe or spot of indeterminable extent on 3-6, a basal lateral spot on the same four segments, the basal half of 7, a large (reddish) spot on each side of 10.

Femora reddish-brown, blackening distally, fore pair pale greenish inferiorly. Tibiae and tarsi wholly black.

Occiput non-tuberculate, its hind margin moderately convex.

Abdomen narrowing from segment 1 (2.6 mm.) to the middle of 3 (.8 mm.), thence widening very gradually to apex of 6 (1.4 mm.), thence widening rapidly to the apex of 8 (2.6 mm.), thence narrowing to the apex of 10 (1.9 mm.).

Superior appendages (Pl. III, figs. 3, 6) 1.96 mm. long, slightly longer than 10, subequal to 9; in dorsal view, their external margins straight and parallel for two-thirds' length of the appendage, each appendage constricted at its extreme base, following which, on the internal side, it is swollen for its first third, then gradually narrows, the terminal third of the appendage strongly curved mesad forming a blunt hook; in profile view, the superior margin is almost straight for two-thirds of the length of the appendage, the inferior margin subparallel, but swollen a little at two-fifths of the same length, no superior or inferior teeth or tubercles, the terminal third of the appendage curved strongly ventrad to an acute apex; superior appendages yellow, brown at apex.

Inferior appendage blackish-brown, stout, two-thirds as long as the superiors; in profile view, its superior margin concave throughout except for the first fifth of the appendage's length, which is straight, slanting caudad and ventrad, and forms an obtuse angulation where the concave curve begins, terminal half of the appendage curved strongly dorsad and slightly cephalad; in ventral view, the appendage is bifid for its entire visible extent *i. e.*, its distal two-thirds, the proximal third being concealed by the sub-anal plates), the two branches in

contact with each other, their external margins slightly converging, their apices roundedly truncate from within laterad.

Genitalia of abd. seg. 2: (Pl. III, figs. 4, 5). Anterior lamina brown, low, entire, with a marginal row of brownish hairs; the other genitalia darker. Anterior hamules bifid at tip, internal branch the longer and more acute, interval separating it from external branch elliptical, narrower at the mouth. Posterior hamules one-and-two-fifths times as long as the anterior hamules, tapering to an acute apex. Vesicle of the penis projecting subequally with the anterior hamules, having on each side a stout antero-ventral angle of somewhat less than 90 degrees. Posterior margin of each auricle almost straight, slightly convex, bearing 5-6 denticles.

Wings barely smoky yellowish. Stigma dark reddish-brown within black veins, surmounting 5-6 cells. Venation, including the costa, black. Forewings with 20 (r), 18 (l) antenodals, the 7th (r) or 6th (l) thicker, 14 (r), 15 (l) postnodals, two posttriangular rows increasing near the level of the nodus with 7-8 marginal cells, a maximum of three rows of cells in the second cubital area. Hind wings with 13 (r), 14 (l) antenodals, the 6th thicker, 13 (r), 14 (l) postnodals, 3 posttriangular cells, then two rows, increasing near the level of separation of Rs bridge from M1+2, with 13-14 marginal cells, proximal row of postanal cells 5, distal row of 4, a maximum of five rows of cells in the second cubital area, anal triangle 4-celled.

Abdomen 33, hind wing 30, costal edge of stigma of fore wing 3.5 mm.

Only the type male has been seen. This handsomely colored species falls near *E. cutainia* and *E. viperinus* in the synopsis of species of *Erpetogomphus* in the Biologia volume, pages 159-160. It differs from *E. cutainia* in the absence of an inferior longitudinal carina on the basal third of the superior appendages, in the strongly ventral curvature of the terminal third of the same appendages and in the shape of their apices, the apparent absence of a second pale antehumeral stripe separating the dark antehumeral and humeral stripes, and of a yellow line on the costa anteriorly, the greater number of ante- and postnodals and the longer wings.

From *E. viperinus*, *E. schausi* differs by the presence of dark markings on the face, the stronger ventral curvature of the terminal third of the superior appendages, the apparent absence of a second pale antehumeral stripe the greater number of ante- and postnodals, etc.

Erpetogomphus diadophis ? Calvert (Plate III, figs. 10-12). Cayuga, house, October 25, 1 ♀. Very similar to the paratype of the species (in coll. Acad. Nat. Sci., Philadelphia) in the shape of the occiput, the very reduced vulvar lamina and the characteristic semicircular groove on the sternum of 9. It is smaller (abdomen 29, hind wing 24, costal edge of stigma, front wing 3 mm.) and the annulate appearance of the abdomen, on 3-7, due to the presence of a transverse median yellow band in *diadophis*, is on first examination not distinct, owing, perhaps, to the apparently less matured coloration of the body generally. I believe that I can recognize the annuli on segments 6 and 7, at least. Color differences, due, possibly, to the same cause (immaturity), are the smaller extent of the dark paramedian stripes of the thorax (mesepisternum) and of those at the humeral, at the obsolete first lateral and at the second lateral sutures, in comparison with those of the paratype of *diadophis*, as our figures show. (Pl. III, figs. 10 and 11, 7 and 8).

The similarity of the vulvar laminae in the two specimens is not identity. The two lobes of the lamina in the Cayuga female are relatively more widely separated than in the paratype (*cf.* Pl. III, figs. 12, 9), although the absolute measurements are as follows: from apex of right lobe to apex of left lobe, Cayuga ♀ .3 mm., *diadophis* ♀ paratype .4 mm.; length of lobes measured from the anterior (*a*) of the two transverse lines shown in Pl. III, figs. 12, 9: Cayuga ♀ .2 mm., ♀ paratype .3 mm.

In addition to the possession by both females of the semicircular groove on the ventral side of segment 9, mentioned above and shown in our figures quoted, both females show a transverse groove (*t*) on the sternum of 8, anterior to the vulvar lamina, and situated in both at three-fourths the length of the sternite, measuring from its anterior extremity to the same line *a*.

Neither the paratype of *diadophis* nor the female from Cayuga is in perfect condition: the former, ever since I received it from the late Mr. McLachlan, has lacked segment 10 and the abdominal appendages. Without additional material it is not possible to decide whether these two females are conspecific or not. All that I am able to say at present is that they appear to be very near to each other on the basis of structural characters, while differing in size and in details of coloring.

Epigomphus subobtusus Selys. Cayuga, dark forest, April 25, 1 ♀; forest, May 3, 1 teneral ♀; forest, 1 ♂ over stream, 1 teneral ♀; stream in dark forest, May 28, 1 ♂, "oblique black and greenish blue

streaks on thorax. Abdomen black with fine yellow segmental lines; a broak yellow mark before end" [*i. e.* on segment 7].

CORDULEGASTERINAE.

Cordulegaster godmani McLachlan. Purulhá, forest, July 10, 1 ♂ 1 ♀ "in cop."

AESHNINAE.

Anax amazili (Burmeister). Cayuga, June 2, stormy night, at light, 1 ♀; August 24, at light, 1 ♀.

In the key to the species of *Anax* in the Biologia volume, page 176, I stated for *amazili* "Superior frontal marking a triangular black spot, no dark ring," by way of contrast with *junius* and *walsinghami*. In well-colored individuals there is on each side, right and left, of the triangular black spot and separated from it by a yellow line, a triangular blue spot, as Hagen (1861, 1867), Brauer (1866) and Martin (1908) have stated. Occasionally these two blue spots are not visible, as in a Costa Rican female before me; in other cases, as in the Cayuga female of June 2, the blue has become a dark brown, although the two spots are not united anteriorly and hence form no ring as in *junius* and *walsinghami*. Still my statement of 1905, quoted above, is incomplete and hence a little confusing. It may be bettered by inserting after "a triangular black spot:" "usually with a separate triangular blue (sometimes brown) spot to right and left."

The capture of these two females *at light* is interesting.

Aeshna cornigera Brauer. Chejel, June 26, 1 ♂, "almost entirely black; some pale greenish markings on thorax laterally." Purulhá, forest, July 10, 1 ♂, "frons and base of abd. turquoise blue. Broad green lateral oblique stripes on thorax. Fine broken green transverse lines on abd." Antigua, 5500 feet, November 24, 1 ♂, 1 ♀. Volcan Santa Maria, November, 1 ♂.

Aeshna multicolor jalapensis (Williamson). Santa Maria, 5500 feet, June 13, 1 ♂. Volcan Santa Maria, October 31, 1 ♀.

Aeshna virens Rambur. Cayuga, on veranda, September 5, 1 ♀.

Gynacantha trifida Rambur. Cayuga, at dusk, April, 1 ♀; forest, August 23, 1 ♀, and 27, 1 ♂.

Gynacantha septima Selys. Cayuga, at dusk, April, 1 ♂; forest, September 16, 1 ♀. The male has the anal triangle 3-celled.

Gynacantha mexicana Selys. Cayuga, at dusk, June 3, 1917, 1 ♂.

Gynacantha tibiata Karsch. Cayuga, forest, August 30, 1 ♀.

Gynacantha gracilis Burmeister. Cayuga, forest, September 4, 1 ♀. This is the most northern locality for this species yet recorded; I have taken it also in Costa Rica, in the Banana River country.*

EXPLANATION OF PLATE III.

Figs. 1-6, *Erpetogomphus schausi* n. sp., type ♂, Purulhá, Guatemala, July 7. Figs. 1, Dorsal, and 2, Right lateral views of the meso-metathorax showing the color pattern. x 6.6. Figs. 3, Dorsal, and 6, Left lateral, views of the apex of the abdomen. x 7. Fig. 4, Right lateral view of penis and vesicle removed from the other genitalia of the second abdominal segment, inverted. Fig. 5, Right lateral view of genitalia of the second abdominal segment, inverted, penis lying between the hamules of the right and left sides; *ah*, anterior, and *ph*, posterior, hamules; *vp*, vesicles of the penis, *ah'*, anterior hamule viewed antero-laterally to show form of apex; *am III*, anterior margin of abdominal segment 3. Figs. 4-5 x 14.3.

Figs. 7-9, *Erpetogomphus diadophis* Calvert, ♀ paratype, Texas. Figs. 7, Dorsal, and 8, Right lateral views of meso-metathorax showing the color pattern. x 6. Fig. 9, Sternite of abdominal segment 8 and part of groove (*g*) on sternite of segment 9. x 12.

Figs. 10-12, *Erpetogomphus diadophis* ? ♀ Cayuga, Guatemala, Oct. 25. Figs. 10, Dorsal, and 11, Right lateral views of meso-metathorax showing the color pattern. x 6.5. Fig. 12, posterior part of abdominal segment 8 and all of segment 9, ventral view. x 12.75.

In figs. 9 and 12: *a*, anterior of the two transverse impressions, and *t*, transverse groove, cephalad of the vulvar lamina (*vl*) (see page 36); *g*, semicircular groove on sternite of 9.

All these figures are based on camera lucida drawings, using a Zeiss compound microscope with objective A (its lower lens off), and ocular 2 (figs. 4, 5, 9 and 12), or compensating ocular 2 (the remaining figures).

(To be continued)

Swarming of the Monarch Butterfly in Iowa (Lep.).

While driving along a country road three miles northwest of Vinton, Iowa, on Sept. 8, 1918, a swarm of Monarch butterflies (*Anosia plexippus* Linn.) attracted my attention. The immediate region is hilly, once wooded, but now only small white oak groves scattered here and there remind one of that fact. At least several hundred butterflies were in this swarm, which, at the time of my observation, did not seem to be moving in any particular direction. Some of the individuals were flying about rather aimlessly a few feet above the ground, while others had alighted on the leaves and branches of the white oak trees. The observation was made at 6.10 P. M., and it is probable that the insects were preparing to settle for the night. The weather was partly cloudy and there was little or no breeze.—DAYTON STONER, State University of Iowa, Iowa City, Iowa.

* Calvert, A. S. & P. P. A Year of Costa Rican Natural History, New York (Macmillan), pp. 315-318. 1917.

A New Genus and Species of Aphid (Hem., Hom.).

By H. F. Wilson, University of Wisconsin, Madison, Wisconsin, and J. J. Davis, U. S. Bureau of Entomology, W. Lafayette, Indiana.

Descriptions made from specimens collected on choke cherry (*Prunus serotina*) at Portage and Madison, Wisconsin, during June and July, 1916 and 1918, respectively. Found in colonies at the tips of the twigs where the forms were noticed in early June but no alate specimens could be found until July 6. The sexual forms were also collected on *Prunus*, September 8, 1912, at Prairie du Chien, Wisconsin. This species is quite distinct from other species found on *Prunus* spp. because of missing nectaries, although all the other characters are typical of the genus *Aphis*.

ASIPHONAPHIS new genus.

Antennae with six segments and wing venation and cauda as in *Aphis*. The character which makes it distinct from *Aphis* is the lack of visible nectaries. The male as well as the oviparous female is apterous.

Type: *Asiphonaphis pruni* n. sp.

Asiphonaphis pruni new species.

Apterous viviparous female.—General color whitish green with bands of dark green, extending across the abdomen. There are about eight distinct bands on the abdomen and two more or less indistinct marks between the thoracic segments. The bands on the abdomen are enlarged in the middle and at both ends. The enlarged areas in the center are angular, while those on the ends are rounded. In the center of each end spot a light spot can be seen which is the opening to the spiracle. In the older individuals the central group of spots are more or less confluent and form a longitudinal stripe extending the length of the abdomen. The last three cross bands show a series of white spots regularly placed either four or six in the first band and four in last.

Antennae light at the base and dusky to black at the tip. Legs, except the knees and tarsi, light colored. Antennae with six segments, the spur of the sixth being slightly longer than the third. The apterous forms producing the sexes in the fall usually have the third and fourth antennal segments coalesced.

Prothorax with a large broad tubercle on each side and abdomen with a series of smaller tubercles along each side.

Cauda curved upward and knobbed at the tip.

Measurements.—Length of body 2.5 mm. Length of antennal segments, III, 0.35 mm.; IV, 0.25 mm.; V, 0.25 mm.: VI, base, 0.166 mm.; spur, 0.46 mm.

Alate viviparous female.—General color of antennae, head and thorax, black. Abdomen light green, with darker green bands as in the apterous female. Antennae and legs dusky to black except the base of the antennae and the basal two-thirds of the tibiae.

Third antennal segment with numerous round sensoria of irregular size and with a thick edge. Fourth segment with three to six or more similar sensoria and fifth with none to two or three small ones besides the usual large sensorium near the distal end.

Prothorax with a large wide tubercle on each side and a series of unusually conspicuous tubercles and hairs along each side of the abdomen.

Wings with two cubital veins and the median vein with two forks the terminal branch about one-third the distance from the tip to point where the first branches. In several individuals at hand the second cubital vein is also forked close to the edge of the wing. In the hind wing it is not uncommon to find the median vein branched near its base. The wing veins conspicuously brown.

Measurements.—Length of body, 2 mm. Length of antennal segments, III, 0.41 mm.; IV, 0.31 mm.; V, 0.27 mm.; VI, base, 0.18 mm.; spur, 0.52 mm.

Apterous male.—Only apterous observed. Head blackish, thorax dusky and abdomen yellowish and slightly dusky with three paler longitudinal areas. Antennae black, legs dusky, cornicles and cauda concolorous with abdomen.

The spur of the sixth antennal segment nearly twice as long as the third; small sensoria on all, excepting the two basal segments, irregularly placed and in numbers as follows: Third segment with none to six, fourth with 8 to 19, fifth with 14 to 17, not including the usual distal one, and base of segment six with none to 2, not including the usual group at apex. Body bearing conspicuous tubercles along each side as in other forms.

Measurements.—Length of body, 1.25 mm.; width, 0.51 mm. Length of antennal segments, III, 0.19 mm.; IV, 0.14 mm.; V, 0.16 mm.; VI, base, 0.09 mm.; spur, 0.35 mm.

Cotypes in the collection of the U. S. National Museum and the authors' collection.

Neocorynura, a Genus of Halictine Bees (Hym.).

By T. D. A. COCKERELL, Boulder, Colorado.

Schrottky proposed the name *Neocorynura* for *Cacosoma* F. Smith, preoccupied. The species are very numerous in Peru, and adjacent parts of Bolivia and Brazil; but they also extend as far north as Mexico, and the following form is to be added to that fauna:

Neocorynura discolor knabiana subsp. n.

♀.—Length about 8 mm., anterior wing 6.7 (true *discolor* 9 mm., wing 7.5 mm.); first abdominal segment reddish-black, brilliant green at sides and base; second segment with laterobasal corners bright green; third with a green basal band, covered with white tomentum. Antennae red at apex.

Cordoba, Vera Cruz, Mexico, January 20, 1908 (*F. Knab*), U. S. Nat. Museum.

Differs from typical *N. discolor*, as described by Smith, and again (from four examples collected by Sallé) by Vachal, in the green base of abdomen. The wings are greyish, with the marginal cell and beyond broadly fuliginous. This is also very near *N. chlorocion* (Vachal), but is easily separated by the black face. It is also related to *N. lignys* (Vachal), which Mr. Knab took at Cordoba on the same day.

The following key separates this from a series of Mexican and Central American specimens now before me, and records some new localities:

Abdomen elongated, distinctly claviform, segments 2 and 3 green at base; males. (Cordova, Mexico, May 10, *L. O. Howard*)*, *N. chlorocion* (Vachal)

Abdomen ordinary, or scarcely elongated; females.....1

1. First abdominal segment with very large coarse punctures; marginal cell and beyond fuscous (Tabernilla, Canal Zone, Panama, July, 1907, *Aug. Busck*) .....*N. cuprifrons* (F. Smith)

First abdominal segment not thus punctured.....2

2. Smaller; area of metathorax brilliant pale green, *N. discolor knabiana* Ckll.

Larger; area of metathorax not thus green...*N. lignys* (Vachal)

* One of the *N. chlorocion* males carries two stylopids; this adds a genus to the list of those parasitized by Stylopids. The *N. chlorocion* have the wings appreciably dusky and the second abdominal segment quite closely punctured, but they are surely this species, which was originally recorded from Orizaba.

Probably one of these is *Rhopalictus chalcozonia* Sichel, of which Sichel said that he had a series from Mexico, but lacked time and space to describe it. Such time and space were never found, so far as I can discover, and the name remains nude. *Halictus konowi* Ducke is the same as *N. cuprifrons,* as Ducke himself stated. Smith, for no valid reason, described the insect as a *Megalopta,* so Ducke's mistake is not surprising. I have examined Smith's type.

From Chanchamayo, Peru (*Rosenberg*), the U. S. Nat. Museum has specimens of *N. lampter* (Vachal) and *N. lepidodes* (Vachal). The latter was described from Bolivia, and is new to Peru. I have one from Mapiri, Bolivia, sent by Schrottky.

Notes on the Phylogeny of the Orthoptera.*

By G. C. Crampton, Ph.D.

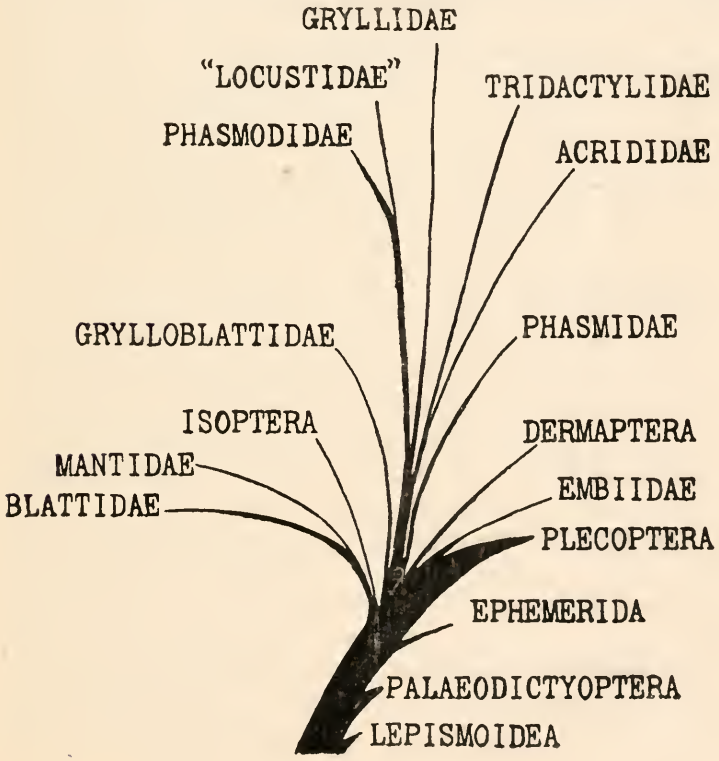
Practically all of those investigators who have recently discussed the phylogeny of the Orthoptera, agree in deriving them from Blattid-like ancestors. In a number of papers dealing with a phylogenetic study of various structural features in insects related to the Orthoptera, I have maintained that the Plecoptera rather than the Blattidae are more like the ancestral stock from which all of these forms are descended, and I would briefly summarize the reason for so thinking in the following discussion.

The appended diagram is offered to aid in visualizing the relationships of the different lines of descent here discussed; but it should be borne in mind that such a diagram should be represented in three dimensions rather than in one plane, if the real relationships of the different groups are to be correctly portrayed. Thus the three lines of descent depicted as though clustering about the Blattids should be represented as though springing off from the main stem at right angles to the plane of the other groups, since these larger groups approach one another from different angles, and the same holds true for the various branches within a larger group; but the diagram as given will serve for all practical purposes.

The "Lepismoid" insects such as *Lepisma, Nicoletia,* etc., (with which such forms as *Machilis* might be likewise includ-

*Contribution from the Entomological Laboratory of the Massachusetts Agricultural College, Amherst, Mass.

ed, although not belonging to the same order) are anatomically intermediate between the other Apterygota and the Pterygota, and are therefore placed at the base of the stem. The fossil Palaeodictyoptera seem to be very near the first winged insects to be evolved, and are therefore placed a little above the Lepismoid forms in the diagram. The Ephemerida are very closely connected with the Palaeodictyoptera, and also exhibit undoubted affinities with the Plecoptera, so that it is extremely difficult to determine whether to group them with the Palaeodictyoptera, or with the Plecoptera—or even in a distinct group to which the strongly aberrant order Odonata should be added. The Ephemerida are placed a little above the Palaeodictyoptera, since they are among the most primitive living winged insects known, (although in some features



they have become rather highly specialized), and it is to the living forms that the following discussion is largely limited.

The Plecoptera appear to be a "synthetic" group combining in themselves a number of features which are carried over into the other lines of development by the more primitive representatives of each group. The Lepismid-like head, the primitive wings, thoracic sclerites and appendages (even the trimerous tarsi may prove to be more primitive than the pentamerous type) and the nature of the abdominal region with its appendages, not to mention the primitive condition of the nervous system, alimentary tract, and other internal structures, all point to the fact that the Plecoptera have departed as little as any living forms from the probable ancestral condition of the forebears of the higher groups, and the palaeontological record is in full accord with this view. As is indicated in the diagram, the Embiidae are extremely closely related to the Plecoptera, and the Dermaptera are closely related to both Embiids and Plecoptera, although they seem to have somewhat more in common with the Embiids than with the Plecoptera. These three orders, together with the Coleoptera, constitute the superorder **Panplecoptera**. Certain Palaeodictyoptera such as *Stenodictya* exhibit a number of features which have been retained by certain members of the superorder Panplecoptera, and it is quite possible that some fossil forms such as the Haplopteroidea or Hadentomoidea might be included in this superorder also; but too little is known of the structural details of most of these fossil insects to enable us to definitely determine their closest affinities in the present state of our knowledge of their anatomy—which seems to be confined largely to wing-veins!

The Blattidae are regarded by most investigators as the lowest living representatives of the group to which they belong, and their type is undoubtedly an extremely ancient one; but I am by no means certain that the Blattidae are so much more primitive (anatomically) than the Isoptera, as some palaeontologists would have us believe. The opisthognathous head, which is typical of the Blattids as a whole, is certainly

of a higher type than the more prognathous one found in many Isoptera, and the great extent of the compound eyes upward toward the top of the head, which occurs in so many Blattids should also be regarded as a more highly specialized condition. The thickening of the fore wings to form tegmina indicates another specialized condition in the Blattids, as does the extremely flattened condition of the body developed in connection with their hiding habits. The asymmetrical development of the genitalia of the males and the asymmetry of the cerci (in regard to the number of segments composing them) and other similar features would indicate that the Blattids are somewhat more modified than the Isoptera in some respects; although in others, the Blattids are much more primitive than the Isoptera. The Isoptera have preserved a number of features occurring in the more primitive members of the group to which the Plecoptera belong, such as the nature of the thoracic sclerites, etc., which suggest that the Isoptera are even closer than the Blattids are, to the very primitive Plecopteroid group; so that if we are to regard the Plecoptera as the nearest living representatives of the ancestors of the other groups under discussion, it might be argued that the Isoptera are near the ancestral type connecting the Blattoid group with the Plecopteroid group. I am as yet unwilling to go to this extreme, however, since I regard the lower Blattids as more primitive than the lower Isoptera, taking their anatomy as a whole. The fossil Protoblattoidea as reconstructed by Handlirsch certainly show a marked resemblance to certain members of the group to which the Plecoptera belong, as well as to the Palaeodictyoptera, and it is quite probable that these Protoblattoidea more nearly represent the ancestral type leading back to the Plecoptera-like forebears than the Isoptera do, particularly since the Isoptera are quite highly specialized in regard to many features in which the Blattids are decidedly primitive.

The Blattids and Mantids are extremely closely related, and their lines of development soon merge in a common stock when traced back toward their point of origin. Handlirsch would

derive the Mantids from Protoblattoid ancestors, and if this be correct, it is very probable that the Blattids also are descended from the same type of ancestor, and the Protoblattoids might be regarded as the forms connecting the Blattids and Mantids with the ancestral Plecopteroid stock. The Isopteron line of development does not follow that of the Blattids quite as closely as the Mantids do, and I am not certain whether the Isoptera branched off from the common Blattid-Mantid stock at a point near the origin of this common stock, or somewhere further along its path of development. There is some reason for considering that the Isopteron line arose rather near the base of this common stock, however, and I would consider that the lack of fossil remains of Isoptera in the earlier strata is again due to the incompleteness of the palaeontological record rather than to the fact that the Isoptera supposedly did not arise until a much later geological period than the Blattids, as Handlirsch would maintain. At any rate, the Isoptera have retained some very primitive characters which occur among the lower representatives of the Plecopteroid group, and their early or late geological appearance cannot alter this fact; so that the study of the ancestral features occurring in the Isoptera and Mantids is extremely instructive for a phylogenetic comparison with the structures of the Dermapteron and Embiid representatives of the Plecopteroid group, with which they have a surprisingly large number of features in common. The Isoptera, Mantidae and Blattidae have been grouped in the superorder *Panisoptera* and it is possible that the fossil Protoblattoidea belong in this superorder also; but I would not group the Corrodentia, Mallophaga and Siphunculata with them, as Handlirsch seems to do. The Corrodentia with the Neuroptera appear to be an offshoot of the Plecopteroid stock leading toward the Hemipteron line of development, and as has been pointed out in several papers, the Corrodentia, Mallophaga, Siphunculata (Anoplura), Thysanoptera, Hemiptera and their allies constitute the superorder *Panhomoptera* whose line of development parallels remarkably closely that of the superorder *Panneuroptera* (composed of the Neuroptera, Mecoptera, Diptera, Siphonaptera, Hymen-

optera, Trichoptera, Lepidoptera, and such fossil forms as the Protomecoptera, etc.). The relationships of these other forms, however, have no bearing on the ancestry of the Orthoptera, and need not be further considered here.

In making a study of the ancestry of the Orthopteroid insects, the condition found in such primitive representatives of the group as the Grylloblattids and Phasmids is fully as instructive as the study of the fossil Orthoptera thus far described, since these fossil forms appear to be in many respects even more highly modified than the Grylloblattids, etc., and one can make out practically nothing of their anatomical details from figures of them, due no doubt to their poor state of preservation, yet in most cases it is just these structural details which give us the clue to relationships and greatly simplify an otherwise extremely difficult study. On this account I have given more attention to the study of the interesting little insect *Grylloblatta campodeiformis* (described by Dr. E. M. Walker) which is so to speak a "living fossil" having preserved many features occurring in the more primitive representatives of the other lower groups of insects, and which appears to have departed as little as any known form from the probable ancestral condition of the Orthoptera as a whole. No one insect, however, has retained all of the ancestral features, and the study of such primitive Phasmids as the interesting little insect *Timema californica* Scudder is no less important, since it has preserved certain features which even *Grylloblatta* has lost. Unfortunately both of these insects are wingless; but I do not consider this a great handicap in such a study, since I cannot help thinking that too great weight has been placed upon a phylogenetic study of the wing veins alone, and anyone who will go into the matter at all deeply will soon become convinced that it is only through an examination of a widely different series of structures from as many parts of the body as possible, that we can come to an approximately correct conclusion in the matter of determining the relationships of the different orders of insects, so that it may perhaps be a good idea to give the already overworked wing-venation a rest, and take up the consideration of some other features as well.

Dr. Walker (Canadian Entomologist, Vol. xlvi, page 93), has maintained that the line of development of *Grylloblatta* should be traced back to the Blattids as the nearest living representative of the ancestors from which the Grylloblattids were derived, while I have contended that although *Grylloblatta* exhibits undoubted affinities with such Blattoid insects as the Mantidae (and Isoptera also), the Embiids and Dermaptera more nearly represent the ancestral stock from which the Grylloblattids were descended.*

(To be continued.)

A Few Hours on Mt. Washington (Lepid.).

On July 31, 1918, I ascended Mt. Washington, on the carriage road, to just beyond the five mile post. Below the Half-way House a short distance, the first *Argynnis montinus* was seen. A little farther on the road they were fairly abundant, one appearing on the wing every few minutes. They settled to feed on the flowers of *Solidago virgaurea* Linn., a very pretty little species of goldenrod, and while so occupied, could be caught, if approached carefully. Some specimens settled in the road, but I did not see any on flowers other than the one mentioned. The specimens were all fresh and in fine condition. Dr. Scudder gives July 12th as the earliest date of their appearance and the latest as September 15th. Some years ago I caught a number of specimens on August 20th at the same locality, but they were not in as fine condition. It is likely that they do not appear before the month of July. Their life history is unknown and to elucidate it some days should be spent on the mountain. I caught a number of females of the species, but was not fortunate enough to find one ovipositing. It is not unlikely that the female drops her eggs over the food plant as is the habit in some other species of the genus. The collector would probably always find the species on clear days during the time of its appearance. In the afternoon, when the east side of the mountain was in the shadow, I did not see any of the butterflies.

Plusia u-aureum Guen. was quite abundant on the goldenrod and in perfect condition. One female of *Chionobas semidea* was taken just above the five mile post. This is probably a low altitude for it on the mountain. This particular day was wonderfully clear and the views superb, and it was a great pleasure to have good collecting and an interesting tramp up the big hill.—Henry Skinner.

*Mr. A. N. Caudell has kindly permitted me to make a study of specimens of Zoraptera (whose line of descent branches off near the base of the Isopteron line), and an examination of this material would indicate that the fairly even balance of characters in the Grylloblattids between the superorders Panisoptera and Panplecoptera is made to swing slightly nearer the Zoraptera and other Panisoptera, thus swinging the base of the line of development of the Grylloblattids slightly toward the side of the Zoraptera (with the Isoptera and Mantidae), although the Grylloblattids are also very close to the Embiids and Dermaptera. It is very probable that the genitalia of male Grylloblattids will be found to resemble those of the Zoraptera remarkably closely.

ENTOMOLOGICAL NEWS.

PHILADELPHIA, PA., FEBUARY, 1919.

Entomology at the Convocation Week Meetings.

When arrangements were first made in the Autumn of 1918 for the meetings of the American Association for the Advancement of Science and Affiliated Societies at Baltimore, December 23 to 28, 1918, wartime conditions were such as to lead to positive discouragement of any large attendance. With the signing of the armistice, an increased interest was manifested and several societies, which had decided to hold no sessions, arranged scientific programs. Nevertheless the annual program of the seventy-first meeting of the A. A. A. S. and of the meetings of other societies is a slim pamphlet of but forty-four pages in comparison with those of recent years. The number of papers, which can be called entomological in any sense, listed therein is but 64, and is much smaller than for many years. Fifty-two of these appear on the program of the American Association of Economic Entomologists, including the Apicultural and Horticultural Inspection Sections, 6 on the joint program of Section F, Zoology, of the A. A. A. S., and the American Society of Zoologists, 2 each on those of the American Society of Naturalists and of the Ecological Society of America, 1 each on those of Section I, Social and Economic Science, A. A. A. S., and the School Garden Association.

The presidential address before the Economic Entomologists, by Dr. E. D. Ball, was on "Economic Entomology,—Its Foundation and Future." Prof. Herbert Osborn, as retiring Vice-President of Section F, spoke on "Zoological Aims and Values." Dr. L. O. Howard gave a paper at the confer-

ence between Government and Laboratory Zoologists arranged for the same section, and Prof. J. G. Needham led the discussion following. Dr. Howard also spoke on "Economic Entomology and the War" before Section I. The two papers with entomological bearing given before the Ecological Society were by H. C. Oberholser, "Ecological Investigations under the Federal Government" and V. E. Shelford, "Suggestions as to the Climograph of Deciduous Forest Invertebrates, as illustrated by Experimental Data on the Codling Moth." Not included in the numbers given above were the papers presented to the Optical Society of America on various optical apparatus, of interest to entomologists.

Smokers for biologists, and dinners for the Naturalists and Ecologists were held as usual.

Entomological Literature.

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded.

The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of papers containing new species are all grouped at the end of each Order of which they treat. Unless mentioned in the title, the number of the new species occurring north of Mexico is given at end of title, within brackets.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

2—Transactions of the American Entomological Society, Philadelphia. **4**—Canadian Entomologist, London, Can. **5**—Psyche, Cambridge, Mass. **7**—Annals of the Entomological Society of America, Columbus, Ohio. **9**—The Entomologist, London. **11**—Annals and Magazine of Natural History, London. **12**—Journal of Economic Entomology, Concord, N. H. **16**—The Lepidopterist, Salem, Mass. **17**—Lepidoptera, Boston, Mass. **19**—Bulletin of the Brooklyn Entomological Society. **20**—Bulletin de la Societe Ento-

mologique de France, Paris. **51**—Archiv fur Mikroskopische Anatomie, Bonn. **54**—Proceedings of the Biological Society of Washington, D. C. **61**—Proceedings of the California Academy of Sciences, San Francisco. **62**—Bulletin of the American Museum of Natural History, New York. **63**—Memorias de la Sociedad Cubana de Historia Natural "Felipe Poey," Habana. **64**—Parasitology, London. **65**—Archives des Sciences Physiques et Naturelles, Geneve. **66**—Records of the Indian Museum, Calcutta. **67**—Le Naturaliste Canadien, Quebec. **68**—Science, Lancaster, Pa. **69**—Comptes Rendus, des Seances de l'Academie des Sciences, Paris. **70**—Journal of Morphology, Philadelphia. **71**—Novitates Zoologicae, Tring, England. **72**—The Annals of Applied Biology, London. **73**—Proceedings of the Linnean Society of New South Wales, Sydney. **74**—Proceedings of the Staten Island Institute of Arts and Sciences, New York. **75**—The Anatomical Record, Philadelphia. **76**—Nature, London.

GENERAL. Bentley, G. M.—Benefits to be derived from observing, collecting and studying insects (Tennessee State Board of Entomology, Knoxville. Bull. No. 20). **Cardin, P. G.**—Notas entomologicas. **63**, iii, 53-61. **F. A. D.**—Nursing habits of ants and termites. **76**, cii, 308-9. **Ellsworth, A.**—The vastness of insect life. **17**, ii, 92-4. **Knab, F.**—Obituary. **12**, xi, 484-5. **Mann, W. M.**—Myrmecophilous insects from Cuba. **5**, xxv, 104-6. **Swett & Cassino**—The White Mountains of New Hampshire. **16**, ii, 90-6 (cont.). **Woodward, C. W.**—The pronunciation of insect names. **19**, xiii, 122-3.

GENETICS. Nakahara, W.—Some observations on the growing oocytes of the stonefly, Perla immarginata, with special regard to the origin and function of the nucleolar structures. **75**, xv, 203-15.

MEDICAL. King, W. V.—Memorandum on a case of dermal myiasis caused by Lucilia sericata. (New Orleans Med. & Surg. Journal, lxxi, 106-8.).

ARACHNIDA AND MYRIAPODA. Brethes, J.—Nephila riverai, nouvelle araignee argentine. **20**, 1918, 216-18.

Chamberlin, R. V.—Myriopods from Okefenokee Swamp, Ga., and from Natchitoches Parish, La. [10 new]. **7**, xi, 369-80. New spiroboloid diplopods [7 n. sps.]. **54**, xxxi, 165-70.

NEUROPTERA. Banks, N.—Termites of Panama and British Guiana. **62**, xxxviii, 659-67. **Dobson, R. J.**—A European termite, Reticulotermes lucifugus, in the vicinity of Boston. **5**, xxv, 99-101 **Howe, R. H.**—Distributional notes on New England Odonata. II.

5, xxv, 106-10. **Kennedy, C. H.**—The varieties of the dragonfly, Agrion aequabile. 4, 1918, 406-11. **Peacock, A. D.**—The structure of the mouthparts and mechanism of feeding in Pediculus humanus. 64, xi, 98-117. **Stohr, R. P.**—Odonates des environs de Saint Alexandre, Ironside, P. Q. 67, xiv, 81-5. **Tillyard, R. J.**—The structure of the cubitus in the wings of the [Australian] Myrmeleontidae. 73, xliii, 116-22. **Whedon, A. D.**—The comparative morphology and possible adaptations of the abdomen in the Odonata. 2, xliv, 373-437.

ORTHOPTERA. Chopard, L.—Apropos des Cylindrachaeta, genre de gryllides endophyte [S. Am.]. 20, 1918, 213-16. **Crampton, G. C.**—The thoracic sclerites of the grasshopper Dissosteira carolina. 7, xi, 347-68. **Dusham, E. H.**—The wax glands of the cockroach (Blatta germanica). 70, xxxi, 563-81.

HEMIPTERA. Ball, E. D.—The phlepsids of Mexico and Cent. Am. (Cicadellinae). 7, xi, 381-92. **Becker, G. G.**—Empoasca mali attacks man. 5, xxv, 101. **Fracker, S. B.**—The Alydinae of the U. S. 7, xi, 255-82. **Green, E. E.**—A list of Coccidae affecting various genera of plants. 72, v, 143-56. **Olsen, C. E.**—Notes on some Cicadellinae in the U. S. Nat. Museum. 19, xiii, 119-21. **Parshley, H. M.**—Three sps. of Anasa injurious in the north. 12, xi, 471-2. **Taylor, L. H.**—The thoracic sclerites of Hemiptera and Heteroptera. 7, xi, 225-54. **Weiss & Dickerson**—The life-history and early stages of Corythucha parshleyi. 4, 1918, 401-6. **Weiss & Nicolay**—The life history and early stages of Calophya nigripennis. 12, xi, 467-70.

Knight, H. H.—Interesting n. sps. of Miridae . . . with a note on Orthocephalus mutabilis [7 new]. 19, xiii, 111-16. **Van Duzee, E. P.**—New species of H., chiefly from California [many new]. 61, viii, 271-308.

LEPIDOPTERA. Bonniwell, J. G.—Arachnis zuni. 16, ii, 85. **Davidson, W. M.**—The California pistol-case bearer (Coleophora sacramenta). 12, xi, 446-53. **Hampson, G. F.**—Some small families of the L. which are not included in the key to the families in the catalogue of Lepidoptera Phalaenae. 71, xxv, 366-94. **Mosher, E.**—Pupae of common Sphingidae of eastern No. Am. 7, xi, 403-42. **Pictet, A.**—Sur l'origine du dimorphisme sexuel de coloration chez les lepidopteres. Intervention de l'elevation de la temperature pour provoquer l'eclosion des papillons. 65, xlvi, Suppl. 17-22, 32-34. **Prout, L. B.**—A provisional arrangement of the Dioptidae. 71, xxv, 395-429. **Reiff, W.**—Colias philodice, f. nigrofasciata. 17, ii, 90-1. **Swett, L. W.**—A new geometrid. 16, ii, 82-4.

Cassino, S. E.—A new form of Cataloca [Catocala] blandula. Catocala faustina f. rubra. **16,** ii, 81-2; 84-5. **Grinnell, F.**—Some variations in the genus Vanessa [3 new]. **5,** xxv, 110-15.

DIPTERA. Cameron, A. E.—The oviposition habit of Gastrophilus nasalis. **68,** xlix, 26. **Davis, W. T.**—The Tabanidae of Staten Island, N. Y. **74,** vi, 201-3. **Johnson, C. W.**—Notes on the species of the genus Dioctria. **5,** xxv, 102-3. **Morris, H. M.**—The larval and pupal stages of Scatopse notata. **72,** v, 102-111. **Prashad, B.**—Larval and pupal stages of an Indian Chaoborus and Dixa. **66,** xv, 153-8. **Roubaud, E.**—Rythmes physiologiques et vol spontane chez l'Anopheles maculipennis. **69,** 1918, 967-9. **Royer, M.**—Note sur la ponte d'Anopheles maculipennis. **20,** 1918, 211-13.

Aldrich, J. M.—The kelp-flies of N. Am. (Fucellia, Anthomyiidae), [4 new]. **61,** viii, 157-179. **Malloch, J. R.**—Three new North Am. Chloropidae. **19,** xiii, 108-11. **Petley, F. W.**—A revision of the genus Sciara of the family Mycetophilidae [2: 28]. **7,** xi, 319-46.

COLEOPTERA. Davis, A. C.—Notes on Pleocoma (II). **19,** xiii, 116-18. **Denier, P.**—Sur le genre Picnoscus (Meloidae) [S. Am.]. **20,** 1918, 208-10. **Kraatz, W. C.**—Scirtes tibialis, with observations on its life history (Dascylidae). **7,** xi, 393-402. **Leng, C. W.**—Some beetles of a Staten Island garden. **74,** vi, 204-9. **Woods, W. C.**—The alimentary canal of the larva of Altica bimarginata. **7,** xi, 283-318.

Blatchley, W. S.—Some new or scarce C. from western and southern Florida [3 new]. **4,** 1918, 416-24. **Wolcott, A. B.**—Notes on Cleridae [2 n. gen.]. **19,** xiii, 107-8.

HYMENOPTERA. Buchner, P.—Vergleichende eistudien I. Die akzessorischen kerne des hymenoptereneies. **51,** xci, Abt. 2, 1-202. **Cockerell, T. D. A.**—Descriptions and records of bees [Mex.]. **11,** ii, 476-82. Bees from British Guiana. **62,** xxxviii, 685-90. **Howard, L. O.**—Two new instances of polyembryony among the Encyrtidae. **68,** xlix, 43-4.

Beutenmuller, W.—Two new Cynipidae. **19,** xiii, 118-19. **Bradley, J. C.**—Descriptions [of 3 new sps.] and records of some interesting parasitic H. mostly collected . . . in Tompkins County, N. Y. **19,** xiii, 98-106. **Cockerell, T. D. A.**—Some halictine bees [2 new]. **9,** 1918, 261-2.

A Collector's Manual in Spanish.—That very energetic worker, Prof. Carlos E. Porter, Director of the Museum and Laboratory of Applied Zoology, etc., at Santiago, Chile, has recently published a

compact, comprehensive and well illustrated manual entitled "Breves Instrucciones para la Recolección, Conservación y Envío de Ejemplares de Historia Natural Para los Museos." In this manual he includes illustrations and instructions covering virtually the whole animal kingdom, and adds seven pages on botany and nine on geology. The portion on Entomology is full and well illustrated. This is evidently a third edition of this useful book, the previous editions having been published in 1901 and 1903.

We have nothing just like this in English, although the U. S. National Museum has published several pamphlets giving directions for collecting and preserving different groups. The bringing of all this material together might be advisable, since many people could use such a work. Evidently Professor Porter has found that his manual is of value in South America, as is shown by the necessity for publishing three editions.—L. O. Howard, Washington, D. C.

Injurious Insects and Useful Birds. Successful Control of Farm Pests. By F. L. Washburn, M.A., Prof. of Entomology, Univ. of Minn.; Entomologist to the Minn. Exper. Station, and State Entomologist; Fellow of A. A. A. S., Member Amer. Assoc. Econ. Ent.; Ent. Soc. Amer., Am. Soc. Naturalists, etc. 414 illustrations in text and four colored plates. J. B. Lippincott Company, Philadelphia and London.—Prof. Washburn states that the suggestions in his book are largely the results of twenty-one years of work in Economic Entomology. The book is intended for the use of high schools, agricultural colleges, farmers, orchardists, vegetable growers, owners of gardens and housekeepers. The questions at the ends of chapters are useful, and in addition to the usual chapters on insects injurious to vegetation there are chapters on insects affecting man and the household; insects and insect-like animals attacking stock and poultry. A very valuable feature is the chapter on the relations of birds to agriculture, which is illustrated by the useful birds. The work closes with the chapter on some of the four-footed pests of the farm. This is an all-round good book and we can heartily recommend it.—Henry Skinner.

Wasp Studies Afield. By Phil Rau and Nellie Rau, with an Introduction by William M. Wheeler. Princeton University Press. 1918. Price $2.00.

We take pleasure in helping to introduce this mightily interesting book. The authors are well known to students of animal behavior for their accuracy in depicting the life and ways of insects. The fact that Prof. Wheeler gives the introduction vouches for the scientific importance of the work. The subject, with one or two exceptions, is the

habits of the wasps that build their nests in burrows. How they go about this, how they provide food for their young, how they find their well-concealed nest again, are all described in the most interesting manner. Marvelous instances of place memory, displays of instinct, are mentioned, also ingenious experiments are made on the homing of the common paper-nest wasp. The book is the result of four years' out-of-door study, generally within a radius of thirty miles of St. Louis, of these wasps "in their natural haunts while pursuing their occupations in their own ways." One of the most interesting chapters is that on "Some Bembicine Wasps," in which are described the nesting and social habits of the western burrowing wasp, *Bembix nubilipennis*. The peculiar nuptial or sun dance is vividly pictured in words. A colony of these wasps nested year after year in a bald and bare space in a field which the boys of the neighborhood kept packed hard in pursuit of their weekly baseball game. Even though suddenly interrupted in their sun dance or nest building, the wasps returned at the first opportunity. How the mother attends the nest and her young until its maturity, and other minute details in the habits of this wasp are mentioned, showing close and patient observation. The chapter on pompilid wasps, especially as regards *Pompiloides tropicus*, is scarcely less interesting. Here are described the peculiar methods of carrying the prey, erratic actions during excavation of the burrows, and the constant guard against parasites. The patience of the observers is somewhat realized when reading this chapter, especially that part relating to the tantalizing actions of *Priocnemis pompilius*. Other chapters describing the habits of some fly-catching wasps, bee-killing wasps, the muddaubers which build their mud nests in the gables and on the rafters of our buildings, wood-boring wasps, the sand-loving ammophila, and the mining eumenid wasps, are all of absorbing interest. The nesting habits of the hunters of Orthoptera in the genera *Alyson, Tachysphex,* and particularly *Priononyx atratum* and *thomae*, are minutely described. Here is told how the cow-bird wasp, *Stizus unicinctus,* watches *thomae* make and supply her nest and, when it is sealed and camouflaged, burrows down, destroys *thomae's* egg and lays her own. In the last chapter, on general considerations, the authors comment on the evidences deduced from their observations. They state that "the data secured give evidence of four very definite attitudes [types?] of behavior: 1. That there are very definite and iron-clad instincts. 2. That, despite these instincts, which are constant in each species, there is much variation in the behavior of the individuals. 3. That there is a display of the expression of emotions in these creatures. 4. That, in many instances, there is much aptitude for learning, display of memory, profiting by experience and what seems to us rational conduct."—E. T. Cresson, Jr.

Doings of Societies.

Entomological Section, Academy of Natural Sciences of Philadelphia.

Meeting of September 26th, 1918, Director Philip Laurent presiding; eleven persons present.

Orthoptera.—Mr. Rehn made a few remarks on the discovery of a new Asiatic species of a hitherto exclusively North American genus of Decticinae (Tettigoniidae), the comments illustrated by a series of all the known species of the genus.

Lepidoptera.—Dr. Skinner reported that he secured a good collection of *Argynnis montinus* in the White Mountains this summer. Mr. Baylis exhibited a specimen of *Catocala herodias*, captured at Lakehurst, New Jersey, this summer, also several specimens of *Chlorippe clyton* bred from larvae taken along the Perkiomen Creek near Philadelphia.—E. T. Cresson, Jr., *Recorder*.

American Entomological Society.

Meeting of April 25, 1918, in the hall of the Academy of Natural Sciences of Philadelphia. Twelve persons present including Dr. Edwin C. Van Dyke, of the Pacific Coast Entomological Society, visitor. Dr. Henry Skinner presided.

Coleoptera.—Dr. Van Dyke made an interesting communication on the general character, habits, distribution, relationship and taxonomic history of the family Elateridae. He discussed and described some of the characters upon which present students are basing their classification in correlation with larval characters, showing some of the faults of the older system. He called attention to specialized characters of protection and adaptation, also to others which show an affinity to, or parallelism with, the Lampyridae. He then took up some of the more important genera, giving general characteristics and distribution, leading into more detailed discussions of those of North America. He divided our fauna into genera of northern, southern, and of isolated origins, and explained the reason for the relationships of some widely separated species. The family is considered very primitive, which, to some extent, accounts for their similarity in general habitus. The work of Schwarz in the *Genera Insectorum* was severely criticized as not being of the constructive character as that of Leconte, Horn and Candeze. He commended the work of Hyslop in his investigations into the characters of the larvae. The speaker made special mention of the genus *Cardiophorus* and discussed in some details some of its peculiar characters. In answer to questions arising in the discussion following his communication, Dr. Van Dyke took up in more detail the origin and general distribution of the coleoptera

of North America, especially in regard to the Glacial, Ozarkan and Sonoran zones of dispersal.

Mr. Rehn spoke of similar zonal dispersion in some orthopteran genera.

Dr. Calvert brought up the question as to the origin and relationships of the Elateridae and Lampyridae, to which Dr. Van Dyke replied that they were evidently very close; probably of the same origin with more or less parallelism in their development of certain characters. Both families are considered by most authors as being of the most primitive of the coleoptera.

Mr. Rehn illustrated the error in considering species as widely spread over certain areas while, in fact, if more detailed collecting was done and more detailed data given as to locality, altitude, and environment, it would be found that such species are more or less restricted, with distribution following only a well-defined, connected life zone.

Meeting of June 10, 1918, in the same hall, Dr. Henry Skinner, President, in the chair. Sixteen persons present including Messrs. Passell and Kline, visitors.

The custodian announced the following donations to the collection: two specimens *Tabanus fusco-punctatus* from Florida, from G. M. Greene; twenty species Crane flies and larvae in alcohol, from C. P. Alexander; 300 microscopic slides of the male genitalia of the genus *Lycaena* (Lepidoptera) and the insects from which the segments were taken, from R. C. Williams, Jr.

Orthoptera.—Mr. Rehn exhibited the series of the Acridid genus *Mermiria* from the Hebard collection, all the known forms being represented by large series. The speaker also made some comments on the relationship and distribution of the species, followed by discussion on the distribution of insects in general by Messrs. Calvert, Skinner and Williams.

Coleoptera.—Mr. Laurent exhibited specimens of *Hylotrupes bajulus* Lec., and the destructive work the larvae had done in a pine board. The speaker cited a case at Anglesea, New Jersey, where the larvae of this beetle had honeycombed the yellow pine flooring of a house to such an extent that it was necessary to lay an entire new floor.

Lepidoptera.—Dr. Skinner reported *Alypia octomaculata* as abundant here this year and swarming in New York.

The following were elected to membership: Messrs. Arthur H. Napier, Geo. M. Greene and J. Wagener Green.—R. C. Williams, Jr., *Recording Secretary.*

Feldman Collecting Social.

Meeting of September 18th, 1918, at the home of H. W. Wenzel, 5614. Stewart Street, Philadelphia; ten members present. President H. W. Wenzel in the chair.

Lepidoptera.—Mr. Haimbach mentioned *Eucosma adamantana* Gn., a species described from Lapland and never seen again from that time until rediscovered by Mr. Daecke in New Jersey sixty years later. Said he had gone to Lucaston on September 12 and, though it was the proper time and he worked over the ground for six hours, he was unable to get a single specimen. Also said he has bred thousands of *Callosamia promethea* Dru. and this year was about to liberate several specimens when he noticed an odd form which proved to be the aberration *cacca* described from a unique female from New York by Cockerell in Packard's Monograph of the Bombycine Moths of North America III, p. 228, 1914, and the type presented to the United States National Museum.

Coleoptera.—Dr. Castle said his annual trip to Maryland was a complete failure though he had gone a week later than usual. All species which were generally common were not found at all. Exhibited specimens of *Popillia japonica* Newm., the Japanese pest, which he had gotten at Riverton, New Jersey, IX-1, saying they will eat anything, that boys are paid to gather them and bring them in by the quart.

Diptera.—Mr. Hornig recorded a species of mosquito, as new to this vicinity, *Aedes curriei* Coquillett, from the northwest, and found here under the same conditions and in the same place with the swamp mosquito.—Geo. M. Greene. *Sec'y.*

OBITUARY.

Victor Arthur Erich Daecke.

In the News for December last we briefly announced the death of our fellow member of the Advisory Committee at Richmond Hill, Long Island, New York, on October 28, 1918. Thanks to the kindness of his sister, Mrs. Jenny Schwensen, of that town, we are able to give some data on his early life.

E. Daecke, as his autograph appears on letters of the past year, was born at Scharnikau, in the province of Posen, Germany, March 28, 1863, and was the son of Julius and Augusta Daecke. Most of his early years were spent in Bromberg, Germany, where he attended the Gymnasium and the Real

Gymnasium. From his early childhood he was a serious lover of nature and of art, the latter interest influenced, no doubt, by a visit through Italy, as a youth.

He came to the United States in 1881 and lived at Montclair, New Jersey, Richmond Hill and New York City, before coming to Philadelphia about 1900. He applied his artistic ability in various lines, being at one time artist with the United States Printing Company, at Brooklyn, and at the time of our first acquaintance with him was connected with the Philadelphia *Press* as an illustrator. He soon became known to the Philadelphia entomologists and apparently the first record of his speaking at the Feldman Collecting Social is that given in the NEWS for December, 1900, (page 642). At the October meeting of that year, he gave the results of some collecting at Castle Rock, Pennsylvania, and Manumuskin, New Jersey. He was nominated for membership on the same evening, his residence being given as 1709 Chestnut Street, and elected at the following November meeting. On November 22, 1900, he became an Associate of the Entomological Section of the Academy of Natural Sciences of Philadelphia, and thereafter scarcely a volume of the NEWS does not contain, under the heading of "Doings of Societies," some records of his collecting activities in New Jersey or Pennsylvania.

In 1907-08 he suffered from a long illness, but after his recovery removed to Harrisburg to become an assistant in the Pennsylvania State Department of Zoology, under Professors H. A. Surface and J. G. Sanders, a position which he held until his death. On October 27, 1910, he was elected a member of the Advisory Committee of the NEWS.

He was a charter member of the Entomological Society of America and a member of the American Association for the Advancement of Science since 1907-08. He became a member of the New York Entomological Society previous to his removal to Philadelphia and in 1895 was Chairman of its Publication Committee.

Mr. Daecke was a most enthusiastic and careful collector, devoting himself to the local fauna wherever he might be. He gathered insects of all orders and paid much attention to

their early stages, life histories and habits. In the early years at Philadelphia he did much with the Odonata, as a paper in the NEWS for January, 1903, indicates, a notable discovery of his in this order being that of *Telagrion? daeckii* at Manumuskin; nor did he ever neglect them, as a note in our issue for last July (page 278) evidences. Later the Tabanidae especially attracted his energies and he prepared the list of species of this family for the 1909 report on the Insects of New Jersey. In this report, Prof. John B. Smith wrote of him: "An excellent general collector whose expeditions into South Jersey have produced a large number of most useful records in almost all orders." Many of his associates are indebted to him for valuable material and he unquestionably did much in the way of accumulating positive data on geographical distribution. The writer especially will greatly miss his kindly aid extending over nearly twenty years.

His nephew, Mr. Erich E. Lehsten, of New York City, writes of him: "Mr. Daecke was always exceedingly self-contained; very rarely discussing his private affairs with anyone; doing all the good he could; giving those with whom he came in contact every assistance in his power, and, to the best of my knowledge, has never injured anyone." He never married, but was a great lover of children.

He contributed the following papers to the NEWS. To bring together his collecting records contained in volumes XI-XXIX is a task of some considerable extent which, we believe, has not been attempted.

Notes on *Prionapteryx nebulifera* Steph. Vol. XVI, pp. 12-14, pl. ii and text figure. January, 1905. [Lepid.]

Two new species of Diptera from New Jersey, *t. c.* pp. 249-251, text figs. October, 1905. [*Chrysops bistellatus, amazon.*]

On the Eye-Coloration of the Genus *Chrysops*. Vol. XVII, pp. 39-42, pl. i. Feb., 1906. [Dipt.]

Mydas fulvifrons. Illiger. *t. c.*, p. 347. Nov., 1906. [Dipt.]

Annotated List of the Species of *Chrysops* occurring in New Jersey, and Descriptions of two New Species. Vol. XVIII, pp. 139-146, pl. vi, text figures April, 1907. [*C. parvulus* and *hinei* new.]

Trypetid Galls and *Eurosta elsa* n. sp. Vol. XXI, pp. 341-343, pl. x. Oct., 1910. [Dipt.; the new species named for his niece, Elsa Schwensen].

PHILIP P. CALVERT.

List of Coleoptera of North America

BY CHARLES W. LENG

A complete list of described species, varieties, subspecies, and synonyms, with page reference to work in which each was originally described, and general distribution of each.

Also a complete list of all works containing original descriptions of North American species from 1758 to the end of 1918, and complete list of the fossil species of North America by Professor H. F. Wickham.

Price, unbound, including delivery, $5.50; printed on one side only, $7.00.

Payment in advance is requested to assist in financing publication. It will be necessary to advance the price upon publication.

Less than 200 subscriptions have so far been received. There should be 500 in hand before publication.

Please send your subscription at once to the publisher.

JOHN D. SHERMAN, JR.
24 CLAREMONT AVENUE
MOUNT VERNON, NEW YORK

NEW ARRIVALS

From Columbia, So. America:

OVER 10,000 BUTTERFLIES, INCLUDING

Morpho cypris
" sulkowskyi
Morpho amathonte
Caligo spp.

From Cuba:

1500 BUTTERFLIES AND MOTHS, INCLUDING

Papilio columbus
" andraemon
" celadon
" devilliersi
Urania boisduvali
Erinyis guttalaris
Protoparce brontes, etc.

From Venezuela:

Over 5000 Lepidoptera
200 Dynastes hercules

From New Guinea:

2000 Coleoptera
200 Orthoptera

From Assam, India:

1200 BUTTERFLIES AND MOTHS, INCLUDING

Papilio arcturus
" philoxenus
Kallima inachis
Brahmaea wallachi

And Many Other Showy Species

From Tibet (Bhutan)

Armandia lidderdalii
Parnassius hardwicki

CATALOGUES OF ENTOMOLOGICAL SUPPLIES AND SPECIMENS ON APPLICATION

If interested kindly send your list of desiderata for further information to

THE KNY-SCHEERER CORPORATION

Department of Natural Science
G. Lagai, Ph.D.

New York
404-410 W. 27th Street

MARCH, 1919.

ENTOMOLOGICAL NEWS

Vol. XXX. No. 3

Thaddeus William Harris
1795-1856.

Smithsonian Institu
MAR 1 1 191
National Mu

PHILIP P. CALVERT, Ph.D., Editor.
E. T. CRESSON, Jr., Associate Editor.

HENRY SKINNER, M.D., Sc.D., Editor Emeritus.

ADVISORY COMMITTEE:

EZRA T. CRESSON, PHILIP LAURENT, GEORGE M. GREENE, J. A. G. REHN, H. W. WENZEL.

PHILADELPHIA:
THE ACADEMY OF NATURAL SCIENCES,
LOGAN SQUARE.

Entered at the Philadelphia Post-Office as Second-Class Matter.
Acceptance for mailing at the special rate of postage provided in Section 1103.
Act of October 3, 1917, authorized on July 19, 1918.

ENTOMOLOGICAL NEWS

published monthly, **excepting August and September,** in charge of the Entomological Section of The Academy of Natural Sciences, Philadelphia, and The American Entomological Society.

ANNUAL SUBSCRIPTION, $2.00 IN ADVANCE.

SINGLE COPIES 24 CENTS.

ADVERTISING RATES: Full width of page. Payments in advance.

One issue, one inch,	$ 1.20,	two inches,	$ 2.40,	half page,	$ 4.00,	full page,	$ 8.00
Five issues,	" 5.50,	"	11.00,	"	17.50,	"	35.00
Ten issues	" 11.00,	"	20.00,	"	35.00,	"	70.00

☞ All remittances, and communications regarding subscriptions, non-receipt of the NEWS or of reprints, and requests for sample copies, should be addressed to ENTOMOLOGICAL NEWS, 1900 Race Street, Philadelphia, Pa. *All Checks and Money Orders to be made payable to the* ENTOMOLOGICAL NEWS.

☞ All complaints regarding non-receipt of issues of the NEWS should be presented within three months from date of mailing of the issue. After that time the numbers will be furnished only at the regular rate for single copies.

☞ Not more than two issues will be replaced gratis through loss, in transit or in change of address, unless such have been registered, at the subscriber's expense.

☞ Address all other communications to the editor, Dr. P. P. Calvert, Zoological Laboratory, University of Pennsylvania, Philadelphia, Pa., from September 15th to June 15th, or at the Academy of Natural Sciences, from June 15th to September 15th.

TO CONTRIBUTORS.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" for each number into the hands of the printer five weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form and without covers, will be given free, when they are wanted; if more than twenty-five copies are desired, this should be stated on the MS. The receipt of all papers will be acknowledged. Proof will be sent to authors for correction only when specially requested.

SPECIAL NOTICE TO AUTHORS

Owing to increased cost of labor and materials, no illustrations will be published in the NEWS during 1919, except where authors furnish the necessary blocks, or pay in advance the cost of making blocks, and pay for the cost of printing plates. Information as to the cost will be furnished in each case on application to the Editor. Blocks furnished or paid for by authors will, of course, be returned to authors, after publication, if desired.

☞ The printer of the NEWS will furnish reprints of articles over and above the twenty-five given free at the following rates: Each printed page or fraction thereof, twenty-five copies, 15 cents; each half tone plate, twenty-five copies, 20 cents; each plate of line cuts, twenty-five copies, 15 cents; greater numbers of copies will be at the corresponding multiples of these rates.

500 PIN-LABELS, 25 CENTS! All Alike on a Strip.

Smallest Type. Pure White Ledger Paper. Not Over 4 Lines or 30 Characters (13 to a Line)
Additional characters 1c. each, per Line, per 500, Trimmed.

C. V. BLACKBURN, 12 Pine St., STONEHAM, MASS., U. S. A.

EPIPSILIA MONOCHROMATEA.—HOOKER.

National M

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

THE ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XXX. MARCH, 1919. NO. 3.

CONTENTS:

Hooker—Notes on the Life History of Epipsilia monochromatea Morr. (Lepid., Noctuidae)..... 61
Crampton—Notes on the Phylogeny of the Orthoptera..... 64
Calvert—Odonata Anisoptera from Guatemala..... 72
Hebard—Remarks on the Species assigned to Cavotettix Hancock, a Synonym of Neotettix Hancock (Orthopt., Acrididae, Acrydiinae) 78
Davis—An Entomologist's Handbook 82
Editorial—The Next International Entomological Congress..... 83
The Jubilee of the Canadian Entomologist..... 83
An Appeal from Belgium..... 84
Entomological Literature..... 85
Doings of Societies—Feldman Collecting Social (Coleop., Orthop., Dip.) 88
Obituary—Benjamin Hayes Smith..... 88

Notes on the Life History of Epipsilia monochromatea Morr. (Lepid., Noctuidae).[1]

By HENRY D. HOOKER, JR., Ph.D.

(Plate IV.)

In the course of some work on *Drosera rotundifolia* during the summer of 1915, *Drosera* plants collected from Beaver Swamp in the city of New Haven, Connecticut, were found to be attacked by the larva of a noctuid moth, which is as far as I know the only insect that eats with impunity this insectivorous plant.[2] The larvae collected in the early part of July were not more than 3 millimeters long and were readily caught and eaten by the *Drosera* plant when brought in contact with the secreting glands of the tentacles. However, the larva

[1] Contribution from the Osborn Botanical Laboratory, Yale University, New Haven, Connecticut.

[2] H. D. Hooker, Jr., 1916. Physiological observations on Drosera rotundifolia. Bull. Torrey Club 43: pp. 4, 5.

avoids this danger by crawling up the under or abaxial side of the leaf petiole and by attacking the leaf from beneath. When young the larva is pale and feeds on the tips of unfolded leaves and on the central bud. As it grows older it becomes greenish and eats mature leaves, invariably approaching them from the under side. When larvae were placed on the upper or adaxial side of the petiole, they immediately crawled around to the opposite side. This was found to be due to the presence of epidermal hairs on the adaxial surface of the petiole. The abaxial surface of the petiole and the under side of the leaf blade are free from these hairs.

The following summer, 1916, it was accidentally discovered that when the larvae reached a length of about 15 mm. they changed their diet, giving up *Drosera* for the cranberry, *Vaccinium macrocarpon*.

The mature larva is 16 mm. long when extended, 12 mm. long when contracted and 2 mm. thick. It is reddish brown on the back and pale yellow-green toward the front on the ventral surface. There is a well developed white dorsal stripe between two parallel black lines. On either side there are three more dark lines. The head is shiny and very dark honey yellow in color. The true legs are of the same color as the head, but not shiny. There are four pairs of transparent false legs, that are dark at the tip. The anal prolegs are of the same color as the dorsal side.

A single mature larva was obtained, which was taken care of and reared by Dr. W. E. Britton at the Connecticut Agricultural Experiment Station in New Haven. The larva pupated between March 1 and 20, 1917, and a male moth emerged May 8, 1917. It was identified by Dr. William Barnes as *Epipsilia monochromatea* Morr.[3] This form was originally described by Morrison[4] as *Agrotis monochromatea*, and is listed as *Pachnobia monochromatea* Morr. by Dyar[5] and Smith.[6] It

[3] W. Barnes and J. McDunnough, 1917. Check list of the Lepidoptera of North America, No. 1475. Decatur.

[4] H. K. Morrison, 1874. Description of new Noctuidae. Proc. Bos. Soc. Nat. Hist. 17, p. 165.

[5] H. G. Dyar, 1902. A list of North American Lepidoptera, p. 131, Washington.

has been reported from Massachusetts,[7] Durham, New Hampshire,[8] and Canada.[9] The first specimen discovered in Connecticut was collected in New Haven, May 24, 1910, by Mr. B. H. Walden, of the Connecticut Agricultural Experiment Station. This specimen was a female. Subsequently a mature larva was found in some sphagnum collected by Professor G. E. Nichols in Beaver Swamp in April, 1918. Mr. Walden found a pupa in the same swamp April 29, 1918; the adult emerged May 25, 1918. Detailed descriptions of the moth are given by Morrison,[10] Smith[11] and Hampson.[12] Morrison describes the form as follows.

The expanse of wings measures 32 mm. The male antennae are very strongly bipectinate. The collar, thorax and anterior wings are uniformly reddish brown. All the lines and spots are obsolete, except the two median lines, which are dark, broad, outwardly curved and subparallel. The posterior wings are brownish fuscous, with yellow fringes.

The life history of *Epipsilea monochromatea* may be outlined as follows. The eggs are laid and hatch out in June or July. The young larvae feed on Drosera until August, and then live on cranberry. The mature larvae pass the winter in Sphagnum, pupate in April and the moth emerges in May.

EXPLANATION OF PLATE IV.

Fig. 1. Young larvae feeding on *Drosera rotundifolia*. Photographed by Professor G. E. Nichols. x 1.
Fig. 2. Mature larva contracted. Photographed by Mr. B. H. Walden. x 1.
Fig. 3. Mature larva on Sphagnum. Photographed by Mr. B. H. Walden. x 1.
Fig. 4. Pupa. Photographed by Mr. B. H. Walden. x 1.
Fig. 5. Posterior hooks of pupa. Photographed by Mr. B. H. Walden. x 5.
Fig. 6. Adult ♂. Photographed by Mr. B. H. Walden. x 2.

[6] J. B. Smith, 1893. A catalogue of the species of moths of the Lepidopterous superfamily Noctuidae found in boreal North America, p. 62. Washington.
[7] H. K. Morrison, *loc. cit.*
[8] G. F. Hampson, 1903. Catalogue of the Noctuidae in the collection of the British Museum Vol. IV, p. 483. London.
[9] A specimen was collected by Dr. Fletcher in Canada.
[10] H. K. Morrison, *loc. cit.*
[11] J. B. Smith, 1890 Revision of the species of the genus *Agrotis*. Bull. No. 38 U. S. Nat. Mus. p. 55.
[12] G. F. Hampson, *loc. cit.*

Notes on the Phylogeny of the Orthoptera.*

By G. C. Crampton, Ph.D.

(Continued from page 48.)

Structures which are of but little importance to the life of the organism, are not greatly affected by natural selection (or by use and disuse, if these are factors in evolution) and are among the least-varying structures within an order or superorder of insects. It is just these structures, however, which are of the utmost phylogenetic importance, since their retention is almost wholly due to heredity alone, and on this account I would lay much greater stress upon the evidence afforded by such structures than upon those which are of greater value in the struggle for existence (and hence subject to its modifications), yet vary a great deal even within the same order of insects. Such structures which furnish very serviceable clews as to the interrelationships of the orders of insects are the cervical sclerites or neck plates, which are remarkably constant within an order, or even superorder of insects, and I have therefore laid greater stress upon the character of the cervical and prothoracic sclerites than upon any other one set of structures, although unless supported by the evidence drawn from many other sources as well, the evidence afforded by these structures alone would be wholly inadequate—as is true of any one set of structures taken alone.

In Vol. 28 (p. 393) of Ent. News for 1917, it was shown that the lateral neck and prothoracic sclerites of *Grylloblatta* are astonishingly like those of the Embiids, even in regard to the minutest details—and the resemblance cannot therefore be attributed to a mere convergence (parallelism) in development. Such a resemblance in these unimportant and little-varying structures can only mean that these types of sclerites were inherited from a common ancestry. While the antennae may vary considerably within an order, or even family of insects, the remarkable resemblance (even in the matter of the relative lengths of the segments, etc.) between the antennae

* Contribution from the Entomological Laboratory of the Massachusetts Agricultural College, Amherst, Mass.

of *Grylloblatta* and *Embia major* Imms adds further support to the contention that the Grylloblattids are quite closely related to the Embiids, as was pointed out in the June, 1917, issue of The Canadian Entomologist (page 213).

In Ent. News, Vol. 26, page 337, attention was called to the resemblance of the tergal thoracic plates of *Grylloblatta* to those of the Dermapterous representatives of the superorder to which the Embiids also belong, and the lateral thoracic sclerites of the Grylloblattids are very like those of the Embiids, although it must be admitted that the lateral thoracic sclerites of *Grylloblatta* are also quite like those of the Isoptera, and the ventral thoracic plates resemble those of the Zoraptera and Mantids as much as those of any other insects.

The legs of *Grylloblatta* are quite like those of the Blattids (and Zoraptera); but I fail to find any other marked Blattid features in the Grylloblattids—although the investigations of Dr. Walker (who is at present working upon the anatomical details of the recently discovered males of *Grylloblatta*) may bring to light other Blattid-like characters in the Grylloblattids. The cerci of *Grylloblatta* are very like those of certain Plecoptera in regard to the relative lengths of the component segments, etc., as was pointed out in a paper published in Vol. 25 of the Journal of the New York Ent. Society (page 225), and I also find a marked resemblance between the cerci of *Grylloblatta* and those of the immature Dermaptera, such as "*Dyscritina*" *longisctosa, Diplatys, Karschiella* and other earwings in which the forceps of the adult are preceded by segmented cerci in the nymphal stages. On the other hand, the cerci of *Grylloblatta* also resemble those of the Mantids to some extent. The ovipositor of *Grylloblatta* could easily be derived from the type found in certain Dermaptera such as *Echinosoma;* but on the whole, the ovipositor of *Grylloblatta* is more like that of certain Mantidae.

From the foregoing discussion, it is evident that *Grylloblatta* resembles the Panplecoptera in regard to the least-varying structures, while in regard to its body as a whole (with the exception of the body contour and its slender nature in which it

is strongly similar to the Embiids and Dermaptera) the resemblances are fairly evenly divided between the Panplecoptera and the Pandictyoptera. *Grylloblatta* has many features in common with the Embiids, Dermaptera, Isoptera, Zoraptera and Mantids, and fewer in common with the Blattids and Plecoptera, so that the choice which we make as to what forms more nearly represent the ancestors of the Grylloblattids depends upon what structures we consider the most important for a phylogenetic study. From my own studies of a rather wide range of anatomical structures, I would be more inclined to regard the neck and prothoracic sclerites as the most dependable features, and taking the evidence as a whole, I have become convinced that Grylloblattids arose from a Plecopteroid stock* (Panplecoptera) rather than from a Blattoid stock (Panisoptera), although it is quite evident that the Grylloblattids branched off from the Plecopteroid stock very near the point at which the Blattoid lines of development likewise branched off from the same Plecopteroid stock, as indicated in the diagram (page 43).

While much attention has been paid to *Grylloblatta* as the most primitive representative of the Orthopteroid group, it must be borne in mind that all of the evidence of relationship must be considered from every available source, and in this connection it would be a very grave error to slight the evidences of relationship presented by that other very primitive Orthopteroid insect *Timema californica* Scud., (a small wingless Phasmid), since *Timema* has preserved certain features which even *Grylloblatta* has lost. *Timema,* like *Grylloblatta,* is wingless in both sexes, and anyone who will compare *Timema* and *Grylloblatta* with the wingless females of the Embiids or Dermaptera will certainly concede that the general appearance of the body is very much more similar in these insects than is the case when one compares the Grylloblattids with the average wingless Blattid or Mantid (or even with the Isoptera, for that matter). Again, while the tarsi of *Grylloblatta* are five-jointed and the legs are quite like those of the Blattids, the

*See footnote, page 48.

tarsi of *Timema,* on the other hand, are but three-jointed, and the legs are extremely similar to those of the Plecopteroid insects, so that in this respect *Timema* is as strongly Plecopteroid as *Grylloblatta* is Blattoid! The head and its appendages in *Timema* are more like these structures in the Plecopteroid insects, as is markedly true of the neck and prothoracic sclerites. I find a strong suggestion of the pronouncedly demarked intersegmental region in front of both the meso- and metathorax in *Timema,* and since to my knowledge, this condition occurs elsewhere only in such Plecopteroid insects as the Embiids and Plecoptera, I think that it is a very important feature in determining the ultimate affinities of *Timema!* The terminal abdominal structures (exclusive of the rather aberrant genitalia of the male) of *Timema* are strongly suggestive of Dermapteron affinities—such for example as the flattened cerci composed of a single segment and bearing mesal prong-like projections, the projecting epiproct (eleventh tergite) and the dorso-ventrally flattened paraprocts (or plates on either side of the anus) which are quite similar in both Dermaptera and *Timema* as may be readily seen by comparing the figures of these structures shown in a paper published in Vol. 13 (page 49) of the Bulletin of the Brooklyn Ent. Soc. for June, 1918. Although the ovipositor of *Timema* is more like that of the Blattids and Mantids, it could have been derived from the type of ovipositor present in such Dermaptera as *Echinosoma* as well, so that the fact that most of the Panplecoptera have not developed (or preserved) an ovipositor would not stand in the way of deriving the Orthopteroid insects from ancestors resembling the Panplecoptera, since some Panplecoptera, at least (*Echinosoma,* etc.), have an ovipositor—and then, too, all of the Orthopteroid insects have not preserved an ovipositor either, since the Gryllotalpids, for example, have none.

From the foregoing discussion, it is apparent that *Timema* is much more like the members of the group Panplecoptera (and the Dermaptera in particular) than it is like the members of the group Pandictyoptera. That I am not alone in this view is evident from the following passage from Mr.

Caudell's paper on the North American Phasmidae (Proc. U. S. Nat. Museum, Vol. 26, p. 884) in which he says "This species (*Timema californica*) apparently represents a step in the transition from the Phasmidae to the Forficulidae. The forcipal cerci of the males, ventrally attached legs, short, broad head, and especially the short, stout legs with the three-jointed tarsi, indicate a relation to the earwigs. As Phasmids these creatures are certainly anomalies, having in one instance at least, been mistaken for a species of Perlid larvae." Handlirsch himself must have been struck with the resemblance of the Orthopteroid insects to the Dermaptera, since he attempts to derive the latter insects from the former, although it is astonishing that he should seek to reverse the evolutionary sequence and derive the Dermaptera from the *Gryllidae*—which is just about on a par with the recent sensational attempt of an English writer to prove that apes are descended from men! The only reason Handlirsch gives for thus arbitrarily discarding all of the evidence of comparative anatomy, embryology, etc., which clearly show that the Dermaptera are more primitive than, and are doubtless "ancestral" to* the Orthoptera in question, is that the known fossil remains of these Orthoptera geologically antedate those of the fossil Dermaptera thus far discovered. Handlirsch makes no allowance for the fact that when the geological formations have been more thoroughly explored it will undoubtedly be found that Dermapterous insects occur in these earlier strata also, and it is this calmly ignoring the evidence of comparative anatomy and embryology that has led him into all sorts of absurdities, such as attempting to derive the winged insects directly from Trilobites (which are not even in the direct line of descent of the Insecta) without reference to the anatomically primitive Apterygota (such as the Protura, etc.), which he is inclined to regard as degenerate winged insects! It may be an indication of the trend

*In stating that the Dermaptera are "ancestral to" the Orthoptera in question, it is merely meant that they have departed but little from the condition which was probably characteristic of the ancestors of the Orthoptera in question.

of the times that so many of our most learned physicists, psychologists, and others, have accepted with blind faith, the revelations of the spiritualist "mediums," but I must confess that I am still old-fashioned enough to be astonished at the ready acceptance that even the most revolutionary ideas of Handlirsch have met with at the hands of such eminent geologists and paleontologists as Schuchert, Lull and others who seem to see nothing at all remarkable in the view that winged insects were derived directly from Trilobites!

When it comes to the discussion of the lines of descent of the saltatorial Orthoptera, however, I would more nearly agree with Handlirsch in his conception of the interrelationships of these insects. The Gryllidae (with the Gryllotalpids, etc.), are undoubtedly very closely related to the Tettigoniidae (formerly called "Locustidae") and their allies, while the Tridactylidae seem to be quite closely related to the so-called Acrididae and their allies. In certain respects, the Tridactylidae occupy a position intermediate between the Acrididae and the Gryllidae, but their line of descent parallels that of the Acrididae quite closely. I formerly proposed that the Acrididae (and Tridactylidae) with their allies constitute an order of insects distinct from that composed of the Locustidae and Gryllidae with their allies; but this is largely a matter of individual opinion depending upon the value one places upon structural differences.

With regard to the relationship of the saltatorial Orthopteroid insects to their more primitive allies, it would appear that such primitive "Locustoid" insects as *Phasmodes* are very like *Grylloblatta* in many respects, and their line of descent has been represented as though quite near that of the Grylloblattids in the diagram. I find many evidences of a rather close relationship between the Oecanthidae and the Grylloblattidae, however, and it is very difficult to determine from the evidence available whether the Grylloblattidae are more closely related to the "Locustidae" or to the Gryllidae. Dr. Walker has contended that the Grylloblattids and Locustids are the more closely related, and a further study of the more primi-

tive "Locustids" may indicate that his view is the correct one; but, since the Gryllid and "Locustid" lines of descent very quickly merge in a common ancestry, in tracing them back to the common stem forms from which the saltatorial Orthoptera arose, it is rather difficult to say which of the two lines is the more closely related to *Grylloblatta*, and until all of the available evidence has been brought forward, it is preferable to suspend judgment in the matter.

I have maintained that the line of development of the Acrididae is closer than that of the Locustid-gryllid group to the Phasmid line of development (of which the Phylliidae are an offshoot), and the recent work of Turner, 1916, on the breeding habits of the Orthoptera (Vol. 9, page 117, of the Annals of the Ent. Soc. of America) would seem to support this view. Handlirsch considers that the Phasmids are connected by the fossil Chresmodidae with the fossil Elcanid forebears of the Tridactylids; but I do not think that such highly specialized Orthopteroid insects as the Elcanidae and their saltatorial allies can be regarded as ancestral to the much more primitive Phasmid *Timema*, whose structural features clearly point to a Panplecopterous ancestry; and the relationship of the lines of descent of these insects as shown in the diagram is more in harmony with the evidence of comparative anatomy. So far as I can judge from the description of these insects, the fossil Elcanidae, Locustopsidae and Chresmodidae should doubtless be included in the superorder Panorthoptera, of which the Phasmidae, Acrididae, "Locustidae," Gryllidae, Grylloblattidae and their allies, form a part. The Thysanoptera, which Handlirsch would group with these insects, seem to have closer affinities with the insects descended from Psocid-like forebears (superorder Panhomoptera), and the Dermaptera (including the Hemimeridae or "Diploglossata," which are true Dermaptera and are not a distinct branch of the Gryllid stock as Handlirsch seems to think) are undoubtedly more closely related to the other members of the superorder Panplecoptera, instead of being more closely related to the Gryllid stock, as Handlirsch would have us believe.

Since Handlirsch's views are so widely accepted, I would briefly summarize the differences between his grouping and derivation of the different lines of descent of the lower winged insects, and that here proposed. Aside from the great difference between Handlirsch's idea of the direct origin of winged insects from Trilobites (while I would derive winged insects from Apterygota, which, with their relatives the Symphyla, are descended from Crustacea related to *Bathynella* and the Isopoda) the principal points wherein the method of grouping and deriving the lines of descent of the lower winged insects as here proposed, differs from that of Handlirsch as given in his book "Die Fossilen Insekten," may be stated as follows. I would gather the Plecoptera, Embiids, Dermaptera, and their allies in an ancestral group, instead of scattering them, as Handlirsch does in his diagram. Handlirsch regards the Dermaptera as an offshoot of the saltatorial Orthoptera instead of placing them in the ancestral superorder Panplecoptera as is here proposed, and he also represents the Diploglossata (Hemimeridae) as a distinct offshoot of the saltatorial Orthoptera, while in reality the Hemimeridae are Dermaptera and should be grouped with them in the superorder Panplecoptera. Handlirsch regards the Phasmids as an offshoot of the saltatorial Orthoptera, while I regard them as nearer the ancestors of these Orthoptera, and I would derive the whole Orthopteroid stock from Panplecopterous forebears—although this Orthopteroid stock branched off very near the point of origin of the Blattoid stock. Handlirsch regards the Thysanoptera as an offshoot of the saltatorial Orthopteroid stock, related to the Dermaptera, while I place the Thysanoptera together with the Corrodentia, Mallophaga and Pediculidae (all of which Handlirsch derives from the Blattidae) in a superorder with the Hemiptera (i. e. in the superorder Panhomoptera), and I consider that this superorder arose at the base of the Neuropteroid group, to which all of them are very closely related. They, with the Neuropteroids, are descended from Plecopteroid (not Blattoid) forebears, and the Hymenoptera arose from the base of the Neuropteroid stock also, and are therefore to be traced

back to Plecopteroid forebears rather than to Mantoid ancestors as Handlirsch considers to be the case. I place the Coleoptera in the group Panplecoptera, next to the Dermapteron line of descent, thus differing from Handlirsch who would derive the Coleoptera from the Protoblattoidea. There are many other points of difference, especially in the grouping and derivation of the higher insects; but these will be taken up under the discussion of the phylogeny of the other groups of insects, in a series of papers dealing with each group in detail.

Odonata Anisoptera from Guatemala

Collected by Messrs. William Schaus and John T. Barnes.

By Philip P. Calvert, University of Pennsylvania, Philadelphia, Pa.

(Continued from page 38.)

Libellulinae.

Libellula foliata (Kirby). Purulhá, 5500 feet, June 30, 1 ♂, "body orange brown, costal margins orange," 1 ♀, swampy road. Guatemala City, July 1, 1 ♂.

These three specimens are younger than those described in the Biologia volume and by Ris, in the Cat. Coll. Zool. Selys, the males having the frons and vertex pale ochre, the female pale greenish brown, both sexes with the labrum orange yellow. In the male from Guatemala City the genital lobe has a posterior process or lobe similar to that figured for *Brechmorhoga postlobata* (Proc. California Acad. Sci. 3d Ser. Zool. I, pl. xxv) but even more distinctly developed. I find no other differentials correlated with the presence of this process so, in spite of the precedent set by naming this *Brechmorhoga,* do not consider this male worthy of a separate name, at least until additional similar specimens come to hand.

Libellula herculea Karsch. Chejel, 3100 feet, June 26, 1 ♂, "at same place as spec. 1. Thorax laterally and below whitish lilacine. Abdomen above deep crimson."

Pseudoleon superbus (Hagen). Zacapa, June 30, 1 ♂. Sanarate, November 21, 1 ♂, 1 ♀. Escuintla, railway track, July 7, 1 ♀.

Uracis imbuta (Burmeister). Cayuga, forest, May 27, "very dry just now," 1 ♀; edge of forest near half dried stream, May 28, 1 pruinose ♂, "head and body grey-blue"; forest, November 19, 1917, 1 ♀. Quirigua, 500 feet, pine woods, February 17, 1 ♀; February 18, 1 ♂; February 24, 1 ♂; forest, March, 3 ♀. Escuintla, April, 1 ♀.

Uracis fastigiata (Burmeister). Escuintla, May, 1917, 1 ♂.

Tholymis citrina Hagen. Cayuga, January 25, 1916, dusk, 1 ♀, "flew into house"; September 2, 1917, veranda, 1 ♀.

Micrathyria didyma didyma (Selys) Ris. Cayuga, forest: June 10, 1 ♀; August 25, 1 ♂, 1 ♀; September 4, 1 ♂.

Micrathyria aequalis (Hagen). Cayuga, August 25, 1 ♀ on veranda.

Orthemis ferruginea (Fabricius). Cayuga, at light: March 7, 1 teneral ♀; April 3, 1 teneral ♀; August 12, 1 ♂ (adult); September 20, 1 ♂, "abdomen purple."

Cannaphila insularis funerea (Carpenter) Ris. Cayuga, April 20, 1 teneral ♂ *a*, 2 ♂ *b*; Cayuga, Rio Negro trail, forest, April 30, 2 ♂ *a*; trail behind Cayuga, forest ridge, dry, May 17, 1915, 1 ♂, 1 ♀ *b*; Cayuga, forest, May 27, 1 ♀ *b*, "abdomen above golden brown with black segmental lines"; June 5, 1 ♂ *b*; in forest, June 20, 1 ♀ *a*, "body fuscous; pale dorsal yellowish line interrupted segmentally; a similar short lateral streak at base of abdomen; oblique pale greenish streaks on thorax." Escuintla, July 7, 1 ♀ *b*.

This is the *Cannaphila angustipennis* (Rambur) of the Biologia volume, page 241, a name which Dr. Ris has shown to be untenable on account of the priority of *angustipennis* Stephens, a homonym. The letters *a* and *b* are employed in the above list of specimens as in the *Biologia* to indicate specimens with entirely yellow labium (*a*) or with the labium more or less marked with black (*b*). It would seem that this difference in labial coloring has no geographical, seasonal or ontogenetic significance.

Cannaphila vibex (Hagen). Tactic, July 30, 1 ♂. Escuintla, May, 1917, 1 ♀.

Anatya normalis Calvert. Cayuga, April 21, 1 ♂; forest, August 31, 1 ♂, 1 ♀, both teneral; September, 1 ♂.

Erythrodiplax funerea (Hagen). Gualan, August, 1 ♂. Caballo Blanco, August, 1 teneral ♂. Polochic River, July 25, 1 ♂. Purulhá, October, 1 ♀. Iguana, open marsh country, August 24, 1 adult ♂.

Erythrodiplax umbrata (Linnaeus). Iguana, open marsh, August 24, 1 ♂. Quirigua, February 8, 1 teneral ♂; open country, March 3, 1 ♂ not fully colored, the dark band on the wings smoky brown instead of pale ochraceous, ill-defined, much narrower at the hind margin than at the costa.

Erythrodiplax ochracea ochracea (Burmeister) Ris. Cayuga: forest, March 29, 1 teneral ♂; April, 1 ♂; May 19, 1 ♂; near stream in bananas, May 28, 1 ♂, "thorax black; abdomen reddish purple; base of wings rich brown"; 1 ♀, "thorax greenish yellow shaded with brown above, abdomen black with yellowish streaks on each segment; base of wings orange brown"; August, 1917, 1 teneral ♂. Quirigua, 1 teneral ♂.

Erythrodiplax connata fusca (Rambur) Ris. Cayuga, May 1, 1916, 1 ♀, "at light, 2 a. m., quiet night," abd. 16, hind wing 20, pter. f. w. 2.5 mm.; stream in bananas, May 28, 1 ♂, "thorax, base of abdomen and base of wings dark brown, abdomen lilacine, terminally black," abd. 20, hind wing 22.5, pter. f. w. 3.5 mm., the brown at base of hind wings not quite attaining triangle; October 27, 1 ♀, 16, 20 and 2.5 mm.; bananas, October 29, 1 teneral ♂, 17, 22, 2.5 mm., 1 ♂, 16, 20, 2.5 mm. Montufar, November, 1917, 1 ♂, 16, 20, 2.5 mm. Iguana, open marsh, August 24, 3 ♂, 16.5-18, 19.5-22, 2.5-3 mm. All of these specimens fall under the section *Erythrodiplax connata, e,* Biologia, pages 259, 261. The measurements and other data here given may aid in the ultimate elucidation of this variable species.

Dythemis velox Hagen. Cayuga, forest, September 4, 1 ♂. Gualan, August, 1 ♂. Joaquina, April 28, 1 ♀.

Brechmorhoga vivax Calvert. Chejel, June, 2 ♂, one having in the posttriangular field, hind wings, three single cells, then two rows, hence as in *B. nubecula.*

Brechmorhoga praecox praecox (Hagen) Ris. Escuintla, forest stream, July 12, 1 ♂.

Brechmorhoga pertinax pertinax (Hagen) Ris. Purulhá, June 27, 1 ♂; forest stream, July 7, 1 ♀. This is *B. pertinax, a,* of the Biologia, page 284.

Brechmorhoga rapax crocosema Ris. Chejel, June 18, 1 ♀. "markings greenish blue, spot on abdomen orange;" June 17, 1 ♂; August, 1 ♀. This is the Guatemalan-Costa Rica form of *rapax* of the Biologia, page 285, not of the original type form of *rapax* which is Venezuelan.

Brechmorhoga inequiunguis (Calvert). Escuintla, July 6, 1 ♀.

Dr. Ris (Cat. Coll. Zool. Selys, fasc. ix, p. 34, 1909; fasc. xv, pp. 868, 870, 1913), defining the genera on a somewhat different basis, has referred this species to *Macrothemis,* as I

originally did, and placed it as a subspecies of *M. tessellata* (Burm.). I have not restudied the questions involved.

Macrothemis pseudimitans Calvert. Escuintla, July 6, 1 ♂; track, August 8, 1 ♂, "eyes, shoulders and dorsum lilac."

Macrothemis hemichlora (Burmeister). Quirigua, March, 1 ♂, 1 ♀, the latter "railway track." Caballo Blanco, August, 1 ♀. Mazatenango, November 30, 1 ♀.

Macrothemis inacuta Calvert. Zacapa, June 30, 1 ♂, 1 ♀; July 26, 1 ♂.

Tramea cophysa Hagen. Cayuga, at light: September 10, 1 ♀; October 11, 1 ♂; November 15, 1917, 1 ♀. The October male is of the *"longicauda,* var?" of the Biologia, page 303, which, following Dr. Ris, I place here.

Perithemis domitia (Drury). In listing this material I have followed the order of the Biologia volume and have given data on the individual specimens, believing such will be useful in later studies of this protean species.

P. domitia form **domitia** (Drury) ? Cayuga, February 2, 1918, 1 ♂; front wings, internal triangle 2-(right) or 3-(left) celled, three posttriangular rows begin at the level of separation of Rs from M1+3; all wings uncolored from base to nodus posterior to subcostal space, yellow for whole width from nodus to apex and in subcostal space from base to nodus. Cayuga, Rio Negro trail, forest, April 30, 1 ♀; front wings, internal triangle 2-(left), 3-(right) celled, discoidal triangle 2-celled (right), free (left), three posttriangular rows begin at the level of separation of Rs from M1+3; discoidal triangles, hind wings, free; all wings orange from base to apex for entire width, a little paler toward hind margin on front wings.

P. domitia form **iris** (Hagen), **i.** 4 ♂ unlabeled as to locality or date.

P. domitia form **iris** (Hagen), **ii.** Gualan, November 4, 3 ♂, 1 of them with discoidal triangle 2-celled, all wings, internal triangle free (right), 2-celled (left).

P. domitia form **iris** (Hagen), **ii** or **iii.** Cayuga, bananas, October 29, 1 ♂.

P. domitia form **mooma** (Kirby). Cayuga: open hill top, June 4, 1 ♂; August, 1 ♀; September 27, close to house, 1 ♀; October 23, house, 1 ♀. Caballo Blanco, August, 1 ♀. The male, of course, might equally well be referred to form *iris,* iii.

Rhodopygia hinei Calvert. Oneida, March 1, 1917, 1 ♀.

The female of this species has not been described, wherefore the following:

Vertex and frons ochre brown, clypeus and occiput paler, more yellowish. Lips yellow, a tendency toward orange in the free margin of the labrum. Rear of the head and bases of the mandibles pale greenish.

Prothorax obscure yellowish, inclining toward ochre in the middle lobe. Thorax brownish yellow, darker on the mesepisterna, which in addition to the long hairs bear numerous closely-set brown spinules.

Abdomen brownish yellow, perhaps even golden yellow in life, more robust than in *R. hollandi* ♀, the only species of this genus of which a female is available for comparison, compressed and evidently partly distorted. Vulvar lamina reaching to one-fifth the length of the lateral margin of 9, flattened on to the sternum thereof so that it is impossible to state its angle of projection, bilobed in its distal half by a semicircular emargination whose width is a little greater than its depth and is subequal to one-fourth of the basal width of the whole lamina. Appendages concolorous, longer than 10, a little shorter than 9, rather stout, very acute at apex.

Legs brownish yellow becoming darker distally on the tibiae and tarsi, the third tarsal joint almost black; spines on the legs black.

Wings hyaline, front wings very pale yellow at base, almost impossible to say where this color ceases but hardly visible distad of the level of the arculus; hind wings a slightly deeper yellow at base, also gradually fading out at the level of the triangle and at about two cells posterior to the level of the hind end of the ash-colored membranule. Stigma pale brownish yellow. Front wings with 19 antenodals, 13R, 14L postnodals, 2 rows of cells between Rs—Rspl a maximum of 3 rows in the anal field proximal to the triangle. Hind wings with 14R, 15L antenodals, 15 postnodals, 1 row (with 1 double cell) R, 2 rows L between Rs—Rspl, 4-3 rows between A3 and the hind margin at the level of the triangle.

Abdomen 33, hind wing 43.5, costal edge of stigma of front wing 4.5 mm.

I refer this individual to *hinei* because of its robust abdomen and the presence, in three of the four wings, of two rows of cells between the subnodal sector (Rs) and the supplementary sector next below (Rspl).

In this connection, I may remark that the size of the pterostigma and very venational characters which Dr. Ris has commented on in his descriptions of *R. hollandi* and *R. chloris* (Cat. Coll. Zool. Selys, Libell. fasc. xiii, pp. 610-612, 1911) lead me to think that it is his *chloris* which is the same form as that which I described previously as *hollandi,* and that

his *hollandi* requires a new name. As far as I can judge the anterior lamina of the true *hollandi* and of *chloris* is less prominent than in his *hollandi*. "*Dunkel* braun" is rather too dark for the basal spot of the hind wing of true *hollandi*.

Having written Dr. Ris to this effect, he has replied (15, ix, 1918):

"*Rhodopygia hollandi* as described by myself from Surinam shows evidently some slight differences from your type of Matto Grosso. Besides the specimens recorded in the main text of Lib. [*i. e.* Cat. Coll. Selys *cit.*] there are three more mentioned in the appendix from the Williamson collection. No doubt Mr. Williamson will send you his specimens for inspection. From these my *Rh. chloris* is evidently different and seems more closely allied to *cardinalis* than to them."

Mr. Williamson has kindly lent me two males from British Guiana, Tumatumari and Georgetown, respectively, both bearing Dr. Ris' own identification label "Rhodopygia Hollandi." An examination of them does not incline me to change my opinion as to their difference from the typical *hollandi* as expressed above. On comparing them with two paratypes of *hollandi* Calvert (Demerara 1 ♂, Cuyaba 1 ♂), now in the Academy of Natural Sciences of Philadelphia, I find that they have

One row of cells between *Rs* (subnodal sector Selys) and *Rspl* (supplementary sector next below) on all the wings (two rows in true *hollandi*); costal edge of the stigma, front wings, 3.25-3.5 mm. (4 mm. in true *hollandi*); the apex or posterior angle of the external branch of the hamule less acute than in typical *hollandi*, when the hamule is viewed in profile so that both external and internal branches are visible at once (as in fig. 54, pl. IX, Biol. C. A. Neur., which does not exaggerate the acuteness of this apex); first femur blackish anteriorly for the whole length (reddish brown in typical *hollandi*), first tibia blackish both above and below (pale reddish or pale reddish yellow in typical *hollandi*), second legs blackish on femur and tibia near their articulation (not so in typical *hollandi*); coloring at the bases of the front and hind wings a darker brown, but of the same extent as in typical *hollandi*. Abd. 32, hind wing 35-36 mm.

Whether *hollandi* Ris varies into *hollandi* Calvert can only be determined by fuller series of specimens.

Sympetrum illotum virgula (Selys). Volcan Santa Maria: October 22, 1 ♂, "abdomen crimson;" October 31, 1 ♂ and 1 pair "in cop."

(5500 feet); November 1, 1 ♀. Antigua, 5500 feet, November 24, 1 ♂. In none of these males does the yellow of the front wings extend continuously to the nodus where each, however, has a small yellow cloud; the blackish basal streak in the subcostal space of the hind wings reaches to the level of the arculus in those of October 22 and November 24; in the other two and in the two females it stops at the first antenodal or but slightly distad. The female of October 31 has the basal yellow confined to a very narrow border around the blackish basal streaks and a mere trace of yellow at the nodus, in that of November 1 the yellow in the subcostal space fades out just beyond the level of the triangle, but the nodal cloud is distinct.

Erythemis attala (Selys). Cayuga, edge of forest in bananas, June 20, 1 ♂, "body brown black, 4 large paired yellow spots on abdomen dorsally." Quirigua, forest, September 16, 1 ♀.

Lepthemis vesiculosa (Fabricius). Cayuga, August, 1 ♂, "emerald green and black."

Remarks on the Species assigned to Cavotettix Hancock, a Synonym of Neotettix Hancock (Orthoptera, Acrididae, Acrydiinae.)

By Morgan Hebard, Philadelphia, Pa.

In the month of November, 1918, there appeared a paper by Dr. J. L. Hancock in the Entomological News, in which a new genus and two new species were described. As one of the species described by Rehn and Hebard in 1916, as a member of the genus *Neotettix*, was assigned to this new genus, the author's interest was at once aroused as to the reason for such generic reassignment.

In order to weigh carefully the features in the problem to be considered, the very large series of *Neotettix femoratus* (Scudder) and *Neotettix bolteri* Hancock, in the Philadelphia collections, have been examined and compared with the material at hand referable to the species assigned to *Cavotettix* by Hancock. From these studies we are satisfied that *Cavotettix* Hancock must fall as a synonym of *Neotettix* Hancock.

Taking Hancock's description of *Cavotettix*, we find that the majority of the features, given as diagnostic for that genus, are those resultant from the retention of an immature pronotal

type in the adult condition. These are: "the body apterous or subapterous.....the tectate dorsum, with the median carina of the pronotum, compressed-cristate..... the broad scapular area at the sides of the pronotum; the lateral lobes of the pronotum bearing but one deep and angular excavate sinus, the superior tegminal sinus being vestigial or entirely obliterated; the tegmina either absent or rudimentary, normally covered from view." These are of no more generic value than similar features shown by species of the genus *Acrydium*, showing the retention of an immature pronotal type in the adult condition.[1]

The remaining characters given for *Cavotettix* are:

"The median carina of the vertex more compressed." This is correct for the species there included. It is in itself insufficient for generic separation.

"The somewhat wider scutellate frontal costa." This is invalid as a generic feature. In *N. bolteri* the frontal costa has been found to vary from the narrower type found in the genotype, *N. femoratus*, to a condition fully as wide as found in the species assigned by Hancock to *Cavotettix*.

"The first joint of the hind tarsi nearly twice the length of the second and third combined." This is a specific but not a generic feature, as the difference between the species discussed and *femoratus* and *bolteri* is not as decided as might at first be supposed, when the moderate amount of individual variability in this feature is noted.

Neotettix proavus Rehn and Hebard.

1916. *Neotettix proavus* Rehn and Hebard, Proc. Acad. Nat. Sci. Phila., 1916, p. 139. [♂, ♀: Murphy, North Carolina; Macon, Buckhead and Jasper, Georgia.]

1918. *Cavotettix apterus* Hancock, Ent. News, XXIX, p. 345. [♂, ♀: Clarksville, Tennessee.]

1918. *Neotettix proavus* Fox, Ent. News, XXIX, p. 347. (Description of caudate phase.) [♀: Clarksville, Tennessee.]

After careful examination and comparison of a considerable

[1] In reference to this remarkable feature, Rehn and Hebard have stated: "That this condition is deep seated in the subfamily is quite apparent, and it is equally evident that it is characteristic of certain species and again occurs as a variant in species normally of the usual type." Proc. Acad. Nat. Sci. Phila., 1916, p. 138, (1916).

series from Clarksville, Tennessee, with the type of *proavus* and other specimens of this species, we unhesitatingly assign *Cavotettix apterus* Hancock to the present synonymy.[2]

In considering the characters given by Hancock as diagnostic for *apterus,* we find them attributable wholly to individual variation, excepting the presence or absence of tegmina and wings. From examination of the series it is ascertained that in this species greatly atrophied tegmina and much reduced wings are present in all, but apparent only in occasional examples.[3]

Measurements (in millimeters)

	Length of body[4]	Length of pronotum	Width of pronotum	Length of caudal femur	Width of caudal femur
♂					
Jasper, Ga.	8.5	7.1	2.25	5.	2.
Macon, Ga. *Allotype*	8.5	7.1	2.45	4.9	1.9
River Junction, Fla.	7.8	7.	2.35	4.9	1.95
Clarksville, Tenn. (20)..	7.5-8.6	7.1-8.1	2.4-2.8	5.3-5.6	2.-2.1
Greenville, Ala.	7.8	7.2	2.3	5.	2.
Evergreen, Ala.	8.3	7.	2.65	5.	2.
♀					
Buckhead, Ga.	9.9	8.3	2.9	5.9	2.15
Macon, Ga. *Type*	10.4	8.8	2.85	5.7	2.1
River Junction, Fla. (2)	9.8-9.9	8.-8.6	2.8-3	5.5-5.8	2.1-2.1
Clarksville, Tenn. (18)..	9.5-10	8.4-9.1	3.-3.15	5.6-6.1	2.1-2.3
Clarksville,Tenn.[5] (2) ...	10.8-10	11.-11.3	3.4-3.4	5.8-6	2.15-2.2

[2] We have received full concurrence in this opinion by James A. G. Rehn, Henry Fox and W. S. Blatchley. The pair from which *apterus* was described was given to Blatchley by Fox, who in turn loaned the specimens to Hancock for examination. Though Hancock stated that *apterus* might be only a race or variety of *proavus,* it is clear that he made no real effort to secure further material for comparison, or to determine the actual values of the characters given as of specific diagnostic importance.

[3] Through a desire to damage or distort the male allotype of *proavus* as little as possible, Rehn and Hebard erred in making the statement "Tegmina absent." Examination of this specimen relaxed shows that, as in the other specimens at hand, vestigial tegmina are present though wholly concealed. It is believed that Hancock is similarly incorrect in his statement concerning *apterus* in his key, "Tegmina absent in female," which statement is qualified by "or entirely hidden from view" in his description.

[4] From vertex to apex of abdomen.

[5] Caudate examples.

The great majority of the specimens are brown (maximum recessive, tawny olive), individually varying to blackish brown. The velvety black posthumeral triangles are very conspicuous in the majority, in a few weakly defined. One female from River Junction is decidedly mottled; while the male from that locality and the female type from Macon alone show a very striking bicolored condition, blackish in the cephalic half, paler and decidedly contrasting verona brown caudad of the posthumeral triangles, the external faces of the caudal femora alone blotched with blackish proximo-mesad.

This species has been found by Dr. Henry Fox to be a spring form; the majority of the series assembled by him were taken about the middle of June. This is probably also true for *N. nullisinus* (Hancock). As our field work has been largely undertaken in the late summer and during the fall, the reason why we have not collected much larger series is apparent.

We have given here a reference to the discussion of the recently discovered caudate type of the present species by Dr. Henry Fox. This is a most interesting feature, ably treated by that author.

Specimens Examined: 50; 26 males[6] and 24 females.

Jasper, Georgia, elevation 1550 feet, VIII, 5, 1913, (R.; woodland composed of mixed pine and oak), 1 ♂, *paratype*, [A. N. S. P.]

Buckhead, near Atlanta, Ga., VIII, 2, 1913, (H.; hillside oak forest), 1 ♀, *paratype*, [A. N. S. P.]

Macon, Ga., VII, 30 and 31, 1913, (R. & H.; woodland of short-leaf pines), 1 ♂, 1 ♀, *type*, *allotype*, [Hebard Cln.].

River Junction, Florida, VIII, 31, 1915, (R. & H.; in damp sandy area of ravine deciduous forest among very scant herbage), 1 ♂, 2 ♀, [Hebard Cln. and A. N. S. P.].

Clarksville, Tennessee, V, 27 to VII, 24, 1917, (H. Fox), 20 ♂, 20 ♀, (2 ♀ caudate), [Fox, A. N. S. P. and Hebard Clns.].

Greenville, Alabama, VIII, 3, 1915, (H.), 1 ♂, [Hebard Cln.].

Evergreen, Ala., VIII, 4, 1915, (H.; in leaf litter on almost bare ground of heavy forest of magnolia, gum and some holly and tulip trees), 1 ♂, [Hebard Cln.].

Neotettix nullisinus (Hancock)

1918. *Cavotettix nullisinus* Hancock, Ent. News, XXIX, p. 344. [♀: Brownsville, Texas.]

The less decidedly tectiform pronotum, with cephalic margin

[6] One male labelled only "Schaum's Collection" is in the Hebard Collection.

of dorsum transverse or very feebly obtuse-angulate produced, and the tegmina which, though reduced, are normally in large part apparent, readily distinguish this interesting species from *N. proavus* Rehn and Hebard.

The previously unknown male of this species is a smaller replica, in all ambisexual features, of the female sex.

Measurements (in millimeters)

	Length of body	Length of pronotum	Width of pronotum	Length of caudal femur	Width of caudal femur
♂					
Houston, Tex.	7.3	7.2	2.3	4.8	2.1
Webster, Tex.	7.4	7.	2.3	4.8	2.2
Webster, Tex.	7.7	7.2	2.35	4.7	2.
Webster, Tex.	7.8	7.	2.35	4.75	2.1
♀					
Houston, Tex.	9.5	8.8	3.	5.7	2.3
Webster, Tex.	9.9	8.8	2.9	5.8	2.3

With the exception of one female, the series is uniform fuscous black in general coloration. The velvety black humeral triangles are weakly indicated in the males, slightly more conspicuous in the females. One female is of the bicolored type which is also found in *proavus;* in this example, the portions cephalad of the posthumeral triangles are blackish brown, those caudad of that point distinctly paler, saccardos umber shading to sepia toward the medio-longitudinal carina on the pronotum.

Specimens Examined: 6; 4 males and 2 females.

Houston, Texas, VIII, 12, 1915, (R. & H.; on ground covered with scant short grass under scattered oaks[7]), 1 ♂, 1 ♀, [Hebard Cln.]

Webster, Harris County, Tex., VII, 19, 1912, (H.), 3 ♂, 1 ♀, [Hebard Cln. and A. N. S. P.].

An Entomologist's Handbook.

An entomologist's handbook or compendium is very much needed, especially by economic entomologists. It is planned to compile such a handbook, which will include principles and methods of studying the life histories of insects, of conducting field experiments and demonstrations, handy tables for field workers, et cetera. It is desired to have references, or better, to have separates of all published notes dealing directly or indirectly with the subject and to have details, and if possible, drawings or photographs as well, of cages, apparatus, methods, etc., as yet unpublished. The handbook will be a compilation and full credit given to all contributions.

The co-operation of entomologists is solicited.—JOHN J. DAVIS, Box 95, West Lafayette, Indiana.

[7] Long continued search in this area, with a view to securing further specimens of this insect, proved fruitless.

ENTOMOLOGICAL NEWS.

PHILADELPHIA, PA., MARCH, 1919.

The Next International Entomological Congress.

The first International Entomological Congress, held in Brussels, Belgium, in 1910, was an unqualified success, both from the scientific and social standpoints. The exposition being held at the same time and place was an additional interest.

The second Congress was held in Oxford, England, during August, 1912, and was equally enjoyable in every way. A feature of this meeting was the pleasant excursions to places near Oxford and the very profitable and enjoyable day spent at Tring. There was a relatively large attendance of Americans at this meeting, seventeen being present and but three at the first Congress.

The third Congress was to have been held in Vienna, Austria, in 1915, but unforeseen, non-entomological European interests made the meeting difficult, if not impossible, so it was not held.

The termination of the war has led some entomologists to think of the next meeting of this association.

Dr. C. Gordon Hewitt, the Dominion Entomologist, suggests holding the Congress in the United States next year, when traveling conditions become settled. He believes that if the congress were held in one of our large cities the attendance would be a record one.

There is no question but that a meeting on this side of the ocean would greatly increase the membership and would afford much pleasure to the delegates and members from abroad who have not visited America.

They would probably also be glad of the opportunity to study our museums and collections.

It will be interesting to know what American entomologists think of the suggestion to have the meeting on this side.—HENRY SKINNER.

The Jubilee of the Canadian Entomologist.

With the number for December, 1918, *The Canadian Entomologist* completed its fiftieth volume, Volume 1, Number 1, bearing the date August 1, 1868. We offer our hearty congratulations to our oldest monthly sister of this continent.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

An Appeal From Belgium.

The following letter has been received from the Curator of the Entomological Section of the Royal Museum of Natural History of Belgium:

[Translation]

Brussels, 11-I-1919.

Dear Sir:

It is absolutely necessary that you write some notices in the American scientific journals in order to save the Selys Catalogue. I have lost twenty subscriptions in Europe and I must retrieve them in the United States. Financial aid from the de Selys family is impossible for a long time. Each new subscription will bring a little capital to the reconstitution of this work which can be brought to a termination with a little energy and with the aid of all. The great institutions, libraries, etc., ought to put some of their pennies into subscriptions.

. . . . . .

Here we have suffered much from the slow and inexorable hunger, from the nervous depression of our abominable slavery that no one can describe. Our museum and our collections are saved, but I have lost one of my two sons who was at the front, a fine boy of 24 years, a captain of engineers. I have lost a part of my small fortune and my health, but more I fear that the sufferings from hunger have compromised the future of my younger son and of my grandchildren.

The balance sheet is sad and I have little courage to take it up. I would not, however, see the Catalogue, to which I have devoted myself for years, founder. This is why I call for your aid. Write to your entomological friends and sustain me.

Yours sorrowfully,

G. SEVERIN.

The Baron Edmond de Selys Longchamps (1813-1900) was known as the chief authority on the taxonomy and geographical distribution of the Odonata. He formed an extensive collection of these insects and of other "neuropteroids" from all parts of the world, and of the vertebrates and some other groups of Europe. These collections were presented after his death to the Brussels Museum by his two sons.

The publication of the *Catalogue Systématique et Descriptif des Collections Zoologiques du Baron Edm. de Selys Longchamps*, "designed to realize the supreme desire of their late possessor and at the same time to serve science," was begun in 1906 under the care of the two sons, M. Severin and a number of zoologists, who undertook, as specialists, the preparation of certain parts thereof.

It was planned to appear in 32 fascicules of a varying number of pages, of large quarto size, illustrated by text figures and some plates. The subscription price for the complete work was fixed at 25 centimes (20 centimes for the fascicules on Orthoptera, Lepidoptera and Vertebrates) per page of text, 2.75 francs per colored plate and 2 francs per black and white plate, with an increase of 25 per cent. for subscriptions to separate parts only.

At the beginning of the war 21 fascicules had appeared, treating of the Orthoptera, Embiidae, Perlodides, Megaloptera, Trichoptera, Ascalaphidae, Libellulinae, Cordulinae, Aeschninae, Birds, Mammals, Amphibians and Fishes, at a total price of 703.50 francs. The eight fascicules on the Libellulinae by Dr. F. Ris, of Rheinau, Switzerland, constitute the most extensive monograph on that subfamily ever produced, and several other groups have been dealt with in a similar fashion. Several fascicules are in such an advanced state of preparation or of printing that they can be issued in a short time.

There are many reasons—scientific, humanitarian, international, appreciative of the nation which has suffered so fearfully—why the Selysian Catalogue should be carried to completion, and it is to be hoped that readers of this appeal will personally do all in their power to aid in this accomplishment by inducing institutions which they can influence to subscribe. All correspondence relating to subscriptions should be addressed to M. G. Severin, Musée Royal l'Histoire Naturelle, 31 Rue Vautier, Bruxelles, Belgium.—PHILIP P. CALVERT, University of Pennsylvania.

Entomological Literature.

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded.

The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of papers containing new species are all grouped at the end of each Order of which they treat. Unless mentioned in the title, the number of the new species occurring north of Mexico is given at end of title, within brackets.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

4—Canadian Entomologist, London, Can. **5**—Psyche, Cambridge, Mass. **8**—The Entomologist's Monthly Magazine, London. **10**—Proceedings of the Entomological Society of Washington, D. C. **15**—Insecutor Inscitiae Menstruus, Washington. **17**—Lepidoptera,

Boston, Mass. **20**—Bulletin de la Societe Entomologique de France, Paris. **22**—Bulletin of Entomological Research, London. **51**—Archiv fur Mikroskopische Anatomie, Bonn. **58**—New York State Museum Bulletin, Albany. **59**—Journal of Agricultural Research, Washington. **63**—Memorias de la Sociedad Cubana de Historia Natural "Felipe Poey," Habana. **68**—Science, Lancaster, Pa. **77**—Comptes Rendus des Seances de la Societe de Biologie, Paris. **78**—Bulletin Biologuque de la France et de la Belgique, Paris. **79**—Bulletin of the Museum of Comparative Zoology at Harvard College, Cambridge, Mass. **80**—Revue Suisse de Zoologie, Geneve. **81**—The Journal of Parasitology, Urbana, Illinois. **82**—The Ohio Journal of Science, Columbus.

GENERAL. Gautier, C.—Etudes physiologiques et parasitologiques sur les lepidopteres nusisibles. La ponte des Apanteles parasite de Pieris brassicae. **77,** lxxxi, 1152-55. **Howard, L. O.**—Entomology and the War. (Scientific Monthly, Lancaster, viii, 109-17). **Mortensen, T.**—Observations on protective adaptations and habits, mainly in marine animals. (Pub. Univ. Zool. Mus. Kobenhaven, N. I., pp. 57-96). **Ramsden, C. T.**—Vida y exploraciones zoologicas del Juan Gundlach en Cuba. **63,** iii, 146-68. **de Sagarra, I.**—Instrucciones por los recollectores d'insectos. (Mus. Barcinonensis Sci. Nat. Opera, Zool., Barcelona, iv, 97 pp.) **Sturtevant, A. H.**—An analysis of the effects of selection. (Carnegie Inst. Wash., Pub. No. 264, 68 pp.) **Weiss, H. B.**—Insects which attract public attention. (Scientific Monthly, Lancaster, viii, 179-86.)

MEDICAL. Sturtevant, A. H.—Flies of the genus Drosophila as possible disease carriers. **81,** v. 84-5.

ARACHNIDA & MYRIAPODA. Carl, J.—Miscellanees diplopodologiques. (Neotropical). **80,** xxvi, 417-68.

Chamberlin, R. V.—New [5] polydesmoid diplopods from Tennessee and Mississippi. **5,** xxv, 122-27.

NEUROPTERA. Banks, N.—Antillean Isoptera. **79.** lxii, 475-89. **Howe, R. H.**—Odonata of the Franconia region, New Hampshire. **4,** 1919, 9-15. **Kennedy, C. H.**—A new sp. of Argia. **4,** 1919, 17-18. **Moore, W.**—The effect of laundering upon lice, (Pediculus corporis) and their eggs. **81,** v, 61-8.

ORTHOPTERA. Chopard, L.—Diagnoses d'Orthopteres nouveaux (Phasgoneuridae) [Neotropical]. **20,** 1918, 243-6. **Du Porte, E. M.**—On the structure and function of the proventriculus of Gryllus pennsylvanicus. **5,** xxv, 117-22. **Pantel & Sinety.**—Reaction chromatique et non chromatique de quelques phasmides aux

excitations dependant de la lumiere. **78,** lii, 177-283. **Piers, H.**—The Orthoptera of Nova Scotia; with descriptions of the species and notes on their occurrence and habits (Proc. & Trans. Nova Scotia, Inst. Sci. xiv, 201-354).

HEMIPTERA. Muir, F.—Notes on the Delphacidae in the British Museum Collection. **4,** 1919, 6-8. **Osborn, H.**—The meadow plant bug, Miris dolabratus. **59,** xv, 175-200. **Wilson, H. F.**—Some new [7] lachnids of the genus Lachniella. **4,** 1919, 18-22 (cont.).

LEPIDOPTERA. French, G. H.—Catocala ulalume vs. C. carolina. **4,** 1919, 16. **Kaye, W. J.**—Catagramma pitheas and C. cyclops distinct species. **8,** 1919. 5-6. **Knetzger, A.**—Hesperids rare at St. Louis, Mo. **17,** iii, 6. **Rothke, M.** Contributions to the life histories of Thyris lugubris, and T. maculata. **17,** iii, 4-5.

DIPTERA. Carter, A. E. J.—Note on the "singing" of Syrphus ribesii while at rest. **8,** 1919, 18. **Hadwen & Cameron.**—A contribution to the knowledge of the bot flies, Gastrophilus intestinalis, G. haemorrhoidalis, and nasalis. **22,** ix, 91-106. **Lamb, C. G.**—On a parasitic Drosophila from Trinidad. **22,** ix, 157-62. **Lodge, O. C.**—An examination of the sense reactions of flies. **22,** ix, 141-52. **Ludlow, C. S.**—Note on Limatus durhami. **5,** xxv, 127-8. **Marchand, W.**—First account of a thermotropism in Anopheles punctipennis, with bionomic observations. **5,** xxv, 130-35. **Mosier & Snyder**—Further notes on Tabanidae in the Florida everglades. **10,** xx, 182-84. **Ross, W. A.**—The identity of the wheat midge in Ontario. **4,** 1919, 16.

Brues, C. T.—New [7] No. Am. Phoridae of the genus Aphiochaeta. **15,** vi, 183-94. **Felt, E. P.**—A study of gall midges. VI. [many new]. **58,** No. 202, 76-205. **McAtee, W. L.**—Key to the nearctic species of the genus Laphria (Asilidae) [12 new]. **82,** xix, 143-70. **Townsend, C. H. T.**—New muscoid genera, species and synonymy. **15,** vi, 157-82.

COLEOPTERA. Barnes, P. T.—Fireflies flashing in unison. **68,** xlix, 72. **Champion, G. C.**—Notes on various species of the genus Chalchas. **8,** 1919, 1-3. **Fisher, W. S.**—Chrysobothris tranquebarica versus impressa. **10,** xx, 173-77.

HYMENOPTERA. Cockerell, T. D. A.—Some halictine bees in the U. S. National museum. **10,** xx, 177-82. **Gatenby, J. B.**—Note on Apanteles glomeratus, a braconid parasite of the larva of Pieris brassicae. **8,** 1919, 19-24 (cont.). **Weiss & Nicolay**—Notes on Closterocerus cinctipennis in New Jersey. **5,** xxv, 128-30.

Rohwer, S. A.—Notes on, and descriptions of sawflies belonging to the tenthredinid tribe Hemichroini [2 new]. **10,** xx, 161-73.

Doings of Societies.

Feldman Collecting Social.

No meeting was held in October owing to the epidemic of influenza.

Meeting of November 20, 1918, at the residence of Wm. S. Huntington, 1006 N. 64th St., Philadelphia; eleven members present; President H. W. Wenzel in the chair.

Coleoptera. Mr. Harbeck said a man in Trenton, New Jersey had complained to him of his war garden being ruined by a large "bug" coming from the ground at night in great numbers, and when he had examined specimens, found them to be *Lucanus dama* Thunb. Mr. Wenzel said there was no doubt but there was something in the garden to attract them, and they were not merely digging in the ground. Mr. H. A. Wenzel said they had found *mazama* LeC. in the west in early morning, running along the trails looking for a place to hide. Mr. H. W. Wenzel said that in July and August he had noticed great numbers of *Cotinus nitidus* Linn. and some weeks later, while cutting the grass, he had seen what he at first had mistaken for an ant hill. When this pile of dirt was pushed aside, quite a large hole was disclosed, and he then took a steel wire with a hook on one end which he inserted in the hole twelve or fourteen inches, and after turning a few times, drew out a large Scarabaeid larva. Many of these were found later. Some he was unable to hook and he came to the conclusion that these burrows had lateral galleries at the bottom. Dr. Castle exhibited a phial containing many larvae and pupae of *Popillia japonica* Newm. from Riverton, New Jersey. Mr. Laurent reported the capture at Mt. Airy, Philadelphia, Pa., of *Lebia tricolor* Say on October 5, *Tachinus limbatus* Melsh. on September 4, and the introduced species, *Sphaeridium 2-pustulatum* Fabr. on October 19.

Orthoptera. Mr. Laurent mentioned that for many years he had reported the large mantis, *Paratenodera sinensis* Sauss. as common, but this year, for the first time, it was scarce, though the nymphs were quite plentiful during June and July.

Diptera. Mr. Hornig stated that this year the first mosquito larvae were found March 27, and the last November 14.—Geo. M. Greene, *Secretary*.

OBITUARY

Benjamin Hayes Smith, a collector of Coleoptera, died at his residence, 4704 Chester Avenue, Philadelphia, on November 25, 1918. He was born in Upper Darby, Delaware County, Pennsylvania, May 7, 1841, son of Dr. George Smith and Mary (Lewis) Smith. Dr. Smith was a prominent physician and citizen of the county and was especially active in the Delaware

County Institute of Science at Media. He was a botanist of note and author of a list of plants of Delaware County which appeared in an important historical work, the *History of Delaware County*, of which he was also the author.

Benjamin H. Smith was educated at Haverford School, afterward Haverford College, where he graduated in 1859. The study of Natural History was strongly encouraged at the school, the collecting of insects being then the favorite pastime, and young Smith, who shared his father's interests, became intensely interested in forming a collection of Coleoptera, a pursuit which he followed for many years afterwards whenever opportunity offered. At the outbreak of the Rebellion he joined the Anderson Troop and served under General Buell throughout the campaign in Tennessee, Alabama and Mississippi, which was later conducted by General Rosecrans, the troop being attached to headquarters.

Smith's ambition had always been to locate in the far west and in 1869 he visited Denver, Colorado, returning in 1872 to take a position in the Surveyor General's office in the Mining Department. He had been married in 1866 to Miss Addie L. Brooke, of Delaware County, and his wife followed him to Colorado as soon as he had established himself and they resided there until 1876, returning again to occupy the same position from 1880 to 1887. His work took him to various parts of Colorado and offered splendid opportunities for the prosecution of his natural history pursuits. He collected beetles assiduously and sent back packages of plants to his father. During his later residence there, botany seemed to occupy his main attention and upon his return to Delaware County, in 1887, he devoted his leisure time almost exclusively to this study. He had visited California and Oregon in 1887, and in 1893 and 1894 spent most of the summer in New Mexico, while he engaged in many other trips to various parts of the east, combining his botanical interests and his love of trout fishing. He was a close friend of the late Dr. Thomas C. Porter and in later years Dr. C. S. Sargeant, with whom he made many trips. After his return to the east he was engaged as an investment broker.

He was a member of the Academy of Natural Sciences of Philadelphia, the American Entomological Society and the Philadelphia Botanical Club, as well as of many historical and literary societies. In the Entomological Society he served on the Committee on Coleoptera in 1879, on the Executive Committee in 1888 and on the Publication Committee from 1889 to 1913.

In spite of his great interest in Natural History, his publications seem to have been entirely upon historical subjects, most of them being contributions to the *Pennsylvania Magazine of History and Biography*, issued by the Historical Society of Pennsylvania.

Mr. Smith was a remarkably well read man, with a knowledge of a variety of subjects, but modest and retiring, so that few realized his attainments. In science he was one of those who find greater satisfaction supplying valuable material and information for the use of others than to engage in original publication.—WITMER STONE.

In August, 1918, he presented his collection of Coleoptera, neatly labeled and arranged in ninety boxes, of a modified Schmitt type, to the Zoological Laboratory of the University of Pennsylvania, where it has been installed in Brock cases. According to a memorandum in the copy of Henshaw's *List* which, marked for the species represented, served as a catalogue of his collection, he had about 10,000 specimens of 2333 species, very largely from Delaware County, Pennsylvania, and from Colorado, but from other States as well. Many of the locality labels (and this applies to the Colorado specimens) give the State name only. At the time when he made this gift, he recalled his personal association with Doctors Le Conte and Horn in the early decades of the Entomological Society, and that failing eyesight caused him to turn his studies from beetles to plants. He left a number of drawings of details of Rhynchophora which his daughter, Miss Alice L. Smith, has placed in the writer's custody; it may be that they can be utilized as illustrations for some future publication on the group.—PHILIP P. CALVERT.

Entomological Books

Complete Set

Proceedings Entomological Society of Philadelphia, Vols. I–VI, and Transactions American Entomological Society, Vols. I–XL, with Supplementary Vol. XIV.

Price on application.

Catalogue No. 6

Just issued—142 pages—entirely devoted to Books on Insects.

Sent on application.

Leng's List

Send in your subscription for Leng's List of North American Coleoptera.

Price $5.50 unbound, including delivery.
Printed on one side only $7.00.

JOHN D. SHERMAN, Jr.

24 CLAREMONT AVENUE

Mount Vernon, New York

NEW ARRIVALS

From Columbia, So. America:

OVER 10,000 BUTTERFLIES, INCLUDING

Morpho cypris
" sulkowskyi
Morpho amathonte
Caligo spp.

From Cuba:

1500 BUTTERFLIES AND MOTHS, INCLUDING

Papilio columbus
" andraemon
" celadon
" devilliersi
Urania boisduvali
Erinyis guttalaris
Protoparce brontes, etc.

From Venezuela:

Over 5000 Lepidoptera
200 Dynastes hercules

From New Guinea:

2000 Coleoptera
200 Orthoptera

From Assam, India:

1200 BUTTERFLIES AND MOTHS, INCLUDING

Papilio arcturus
" philoxenus
Kallima inachis
Brahmaea wallachi

And Many Other Showy Species

From Tibet (Bhutan)

Armandia lidderdalii
Parnassius hardwicki

CATALOGUES OF ENTOMOLOGICAL SUPPLIES AND SPECIMENS ON APPLICATION

If interested kindly send your list of desiderata for further information to

THE KNY-SCHEERER CORPORATION

Department of Natural Science
G. Lagai, Ph.D.

New York
404-410 W. 27th Street

APRIL, 1919.

ENTOMOLOGICAL NEWS

Vol. XXX. No. 4.

Thaddeus William Harris
1795-1856.

Smithsonian Institution
APR 7 1919
National Museum

PHILIP P. CALVERT, Ph.D., Editor.
E. T. CRESSON, Jr., Associate Editor.

HENRY SKINNER, M.D., Sc.D., Editor Emeritus.

ADVISORY COMMITTEE:

EZRA T. CRESSON, PHILIP LAURENT, GEORGE M. GREENE, J. A. G. REHN, H. W. WENZEL.

PHILADELPHIA:
THE ACADEMY OF NATURAL SCIENCES,
LOGAN SQUARE.

Entered at the Philadelphia Post-Office as Second-Class Matter.
Acceptance for mailing at the special rate of postage provided in Section 1103
Act of October 3, 1917, authorized on July 19, 1918.

ENTOMOLOGICAL NEWS

published monthly, **excepting August and September,** in charge of the Entomological Section of The Academy of Natural Sciences, Philadelphia, and The American Entomological Society.

ANNUAL SUBSCRIPTION, $2.00 IN ADVANCE.

SINGLE COPIES 24 CENTS.

ADVERTISING RATES: **Full width of page. Payments in advance.**

One issue, one inch,	$ 1.20,	two inches,	$ 2.40,	half page,	$ 4.00,	full page,	$ 8.00
Five issues,	" 5.50,	"	11.00,	"	17.50,	"	35.00
Ten issues	" 11.00,	"	20.00,	"	35.00,	"	70.00

☞ All remittances, and communications regarding subscriptions, non-receipt of the NEWS or of reprints, and requests for sample copies, should be addressed to ENTOMOLOGICAL NEWS, 1900 Race Street, Philadelphia, Pa. *All Checks and Money Orders to be made payable to the* ENTOMOLOGICAL NEWS.

☞ All complaints regarding non-receipt of issues of the NEWS should be presented within three months from date of mailing of the issue. After that time the numbers will be furnished only at the regular rate for single copies.

☞ Not more than two issues will be replaced gratis through loss, in transit or in change of address, unless such have been registered, at the subscriber's expense.

☞ Address all other communications to the editor, Dr. P. P. Calvert, Zoological Laboratory, University of Pennsylvania, Philadelphia, Pa., from September 15th to June 15th, or at the Academy of Natural Sciences, from June 15th to September 15th.

TO CONTRIBUTORS.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" for each number into the hands of the printer five weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form and without covers, will be given free, when they are wanted; if more than twenty-five copies are desired, this should be stated on the MS. The receipt of all papers will be acknowledged. Proof will be sent to authors for correction only when specially requested.

SPECIAL NOTICE TO AUTHORS

Owing to increased cost of labor and materials, no illustrations will be published in the NEWS during 1919, except where authors furnish the necessary blocks, or pay in advance the cost of making blocks, and pay for the cost of printing plates. Information as to the cost will be furnished in each case on application to the Editor. Blocks furnished or paid for by authors will, of course, be returned to authors, after publication, if desired.

☞ The printer of the NEWS will furnish reprints of articles over and above the twenty-five given free at the following rates: Each printed page or fraction thereof, twenty-five copies, 15 cents; each half tone plate, twenty-five copies, 20 cents; each plate of line cuts, twenty-five copies, 15 cents; greater numbers of copies will be at the corresponding multiples of these rates.

500 PIN-LABELS, 25 CENTS! All Alike on a Strip.

Smallest Type. Pure White Ledger Paper. Not Over 4 Lines or 30 Characters (13 to a Line)
Additional characters 1c. each, per Line, per 500, Trimmed.

C. V. BLACKBURN, 12 Pine St., STONEHAM, MASS., U. S. A.

EUCLEMENSIA BASSETTELLA.—HOLLINGER AND PARKS.

Smithsonian Institution
National Museum

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

THE ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XXX. APRIL, 1919. NO. 4.

CONTENTS:

Hollinger and Parks—Euclemensia bassettella (Clemens), the Kermes Parasite (Micro-lepidoptera, Tineoides, Oecophoridae)..... 91
Skinner—A new Species of Copaeodes (Lep.)..... 100
Weiss—A Resurrected Paper on Mosquitos and Malaria (Diptera)..... 101
McDunnough—Change of Address.... 102
Ferris—Two Species of Phylloxera from California (Hemip ; Aphidae) 103
Kennedy—The Naiad of the Odonate Genus Coryphaeschna..... 105
Braun—Descriptions of New Species of Coleophora (Micro-lepidoptera)... 108
Coleman—An Aberration of Polygonia progne (Lepid.)..... 112
"Seventeen Year Grasshoppers"..... 113
Editorial—Swat the Fly Versus Starve the Brute..... 114
Cockerell—Crabro montanus Cresson (Hym.)..... 114
Cockerell—Capture of Ants by Gummy Exudations (Hym.)..... 115
Entomological Literature..... 115
Doings of Societies—Ent. Sec. Acad. Nat. Sci. Phil. (Hymen., Lepid.).. 118
Feldman Collecting Social (Lepid., Coleop., Orth., Dipt.)..... 119
Ohio Entomological Workers..... 120

Euclemensia bassettella (Clemens), the Kermes Parasite (Micro-lepidoptera, Tineoidea, Oecophoridae).

By ALBERT HAROLD HOLLINGER, Bryan, Texas, and HARRIS BRALEY PARKS, College Station, Texas.*

(Plate V.)

HISTORY

In March, 1864, Clemens established the genus *Hamadryas* for a microlepidopteron received from H. F. Bassett, of Waterbury, Connecticut. Clemens named the species in honor of Bassett, and it was known as *Hamadryas bassettella* Clemens until April, 1878. Grote in that year called attention to the pre-occupancy of Clemens' genus *Hamadryas* in the *Lepidoptera* by Hübner and Boisduval, and he proposed the name *Euclemensia* as a generic substitute. It has since been referred to as *Euclemensia bassettella* (Clemens) in literature and in manuscripts.

*The authors' names are alphabetically arranged, and do not denote seniority.

There seem to have been some conflicting notes in literature relative to the habits of this pretty moth (plate V, C). Clemens quotes Bassett, saying: "The species is very common in the neighborhood of Waterbury, Connecticut, and the larva feeds in a gall found on a species of oak which I call *Quercus tinctoria*. The galls are found on the smaller branches, three or four being aggregated, are globular, yellowish-brown, shining and hard."

Comstock (1880*b*)† says that this beautiful moth with reddish-orange-marked fore wings was bred from a large gall-like coccid from Cedar Keys, Florida, and that Riley pointed out to Bassett that his supposed gall was in reality a coccid. Comstock further says: "The rearing of the same moth from what is evidently a closely allied, if not the same, species of coccid from two such widely separated localities as Connecticut and Florida, is a strong indication of the permanence of the carnivorous habit in this species."

Packard (1890*b*) on page 219 of his "Forest Insects" says: "The following species are said by Clemens and Chambers to live on the leaves of various species of oak," and on page 220 *E. bassettella* (Clemens) is listed as a leaf miner of the under surface of oak leaves, with a further note that it feeds in galls. Evidently Packard overlooked Comstock's record.

King (1899) says that in Massachusetts *Kermes galliformis* Riley is attacked by *Euclemensia bassettella* (Clemens).

Britton (1916) states: "Specimens of a *Kermes*, probably *K. sassceri* King, were collected on an oak at Yalesville, April 13, 1916, by B. H. Walden. On examining this material during the summer four specimens of a small moth were found in the box, and in the scales were holes from which the moths had emerged. The moths proved to be *Euclemensia bassettella* (Clemens)."

Lawson (1917) records this moth from *Kermes galliformis* Riley taken at Lawrence, Kansas, and identified by Dr. McDunnough.

Due to the fact that in both Missouri and Texas this oecoph-

†Dates in parentheses refer to the bibliography listed at the end of this article.

orid moth has been reared abundantly from *Kermes* of more than one species, the writers are led to believe that Bassett's "galls" were nothing more nor less than some species of *Kermes,* and that Packard merely copied Clemens' notes which accompanied the original description of this microlepidopteron. This view is strongly emphasized or even substantiated by the records of Comstock, King, Britton and Lawson.

Other Records of Parasitised Kermes.

The only other known records of the genus *Kermes* being infested by lepidopterous larvae are those given below.

Chambers (1878) described *Blastobasis coccivorella,* a species of *Tineoidea* which was reared abundantly from a large coccid, *Kermes* sp. from Florida. Comstock (1880*a*) says that some of the scales were pierced by round holes and entirely eaten out. By dissecting apparently sound ones, he found a few full-grown lepidopterous larvae measuring about eight millimeters long. These were plump, the 4th and 5th abdominal segments being the largest. The general color was milk-white, the head light brown with darker brown mouth-parts. The prothoracic plate was narrow, light brown, and divided longitudinally in the middle. It had six well-developed thoracic legs and five pairs of pro-legs. When the larva began pupating, it first cut an opening through the exterior of the coccid, which up to that time had been entire. Then it spun up a comparatively compact cocoon on the outside of the coccid, attached to the edges of the circular hole.

Dyar (1902), however, does not record Chambers' species at all, and the writers can find no other place in literature where *B. coccivorella* Chambers is mentioned. Is it a synonym of some valid species, or was it entirely overlooked by Dyar in his check-list?

Comstock (1880*a*) described a tineid moth, *Dakruma coccidivora* (=*Dakruma pallida*), which was reared from a species of *Kermes* from Sanford and from Fort George, Florida. He gave the following account of the larval habits of the parasite: "When full-grown the larva leaves the coccid, which it infested, and makes a cocoon which is attached to the outside of

the coccid or to a neighboring twig." *Dakruma coccidivora* Comstock is now known as *Lactilia coccidivora* (Comstock). (Fracker, 1917).

Packard (1890*a*), from some of C. V. Riley's unpublished notes, states that: "These scales from Silver City, New Mexico, were infested with the larvae of a lepidopteron apparently belonging to *Lactilia* (=*Dakruma*)," which issued in April, 1881. It is quite possible that this species is the same as that described by Comstock (1880*a*).

Distribution.

Euclemensia bassettella (Clemens) has been reported in literature from the following states: Connecticut, Florida, Kansas, Massachusetts and Texas. Having found it to occur abundantly in both Missouri and Texas, we believe it safe to say that this parasitic lepidopteron is generally distributed at least over the eastern half of the United States. It is our further opinion that this species will be found to occur in nearly every state east of the Rocky Mountains, and possibly even throughout the extent of this country.

Occurrence in Missouri.

While on a collecting trip the twenty-sixth of April, 1917, Parks was attracted by a pair of downy woodpeckers, *Dryobates pubescens medianus*, which were working arduously in a clump of watersprouts of a shingle oak, *Quercus imbricaria* Michx., near Albany, Gentry County, Missouri. Subsequent investigation showed that the oak was heavily infested by *Kermes pettiti* Ehrh., (plate V, H). Each bird detached a *Kermes* and then placed it securely in a fork made by two twigs or in some roughened crevice in the old trunk. After some little hammering and pecking they withdrew something from the interior of the *Kermes* and swallowed it. They would then look for another coccid and after finding one to their liking they would again go through a similar procedure. In all cases they left the hard shell of the dismembered *Kermes* behind them.

Later investigation showed the presence of white lepidopter-

ous larvae (plate V, A) within many of the gall-like coccids. With exception of a few *Kermes* that the birds had opened in *situ,* no attached specimens showed the presence of abnormal conditions at this date, (plate V, Hb).

Much of the *Kermes* material was given over to Hollinger, and it was placed in the laboratory in a rearing cage on the ninth of June. The first moth appeared on the twenty-seventh of June and by the middle of July twenty-three moths had emerged and which were identified as *Euclemensia bassettella* (Clemens) by Mr. A. Busck, of the United States Bureau of Entomology. On the twelfth of July some of the apparently normal *Kermes* were opened, and from these were obtained three larvae and four pupae.

The adult moths have been observed in July, 1917, by Dr. L. Haseman, Entomologist of the Missouri Agricultural Experiment Station. They were frequenting the blossoms of the garden onion. Hollinger collected an adult on the fifteenth of August flying in his own garden. These two records of the moths flying at large, with exception of a recent additional record from Texas, are the only ones that have come to the attention of the writers.

Occurrence in Texas.

Since the writing of the first draft of this article, the writers have removed to Texas. Our new positions have given us unusual opportunity to observe the occurrence and habits of *Euclemensia bassettella* (Clemens) in that state.

Early in January, 1918, a remarkable infestation of *Kermes galliformis* Riley was discovered on *Quercus stellata* Wang. near Corsicana, Navarro County, Texas. The *Kermes* were in such large numbers that many limbs had succumbed to their attack. Investigation revealed the fact that the coccids were heavily infested by the euclemensid larvae. From specimens collected the adults emerged in the laboratory about the middle of July. Numerous other severe infestations have been under observation, and the following list will give the host plants and the locality from which *Euclemensia*-infested *Kermes* have been reared, together with the dates of emergence of the adults.

Quercus marilandica Muench			
Black Jack Oak	Anderson County		July, 1918
	Brazos County		" "
	Henderson County		" "
Quercus stellata Wang, Post Oak	Brazos County		" "
	Fannin County		" "
	Navarro County	26	July, 1918
	Robertson County		July, 1918
	Van Zandt County		" "
Quercus virginiana Mill, Live Oak	McLennan County	24	July, 1918
	San Patricio County		July, 1918
	Travis County		" "
Quercus undulata Torrey			
Shinnery Oak	Comanche County		" "
	Crosby County	26	July, 1918
Quercus nigra L., Water Oak	Brazos County		July, 1918
	Cook County		" "
	Grayson County		" "

On the third of August, 1918, a single adult *Euclemensia bassettella* (Clemens) was collected by Parks in Robertson County from the flowers of cultivated onions. This is the only adult that has been seen flying at large in Texas.

Habits.

When the larva (plate V, A) becomes full-grown, it cuts a circular to oval hole about one or one and one-half millimeters in diameter through the hard body-wall of the host (plate V, D, F, Ha). This hole is then closed securely with a thin, tough mesh of silken threads (plate V, Fc), after which the larva crawls backward to the end of its retreat. Here it transforms to the pupal stage, which is naked, (plate V, B) no cocoon being spun.

In all the infested *Kermes* examined, the larva apparently produces a more or less distinctly "U-shaped" retreat or burrow, (plate V, E) living entirely within this division and not working at large throughout the body of the *Kermes*. This retreat occupies the lower half of all the infested hosts and nearly comes together at the ends, yet leaves a small space between the ends of the "U."

After emerging from its pupa, the moth in some way breaks the strands of silken threads over the opening cut by the larva

and makes its escape (plate V, Fm). While most of the larvae inherit the instinct to cut the hole through the body-wall of the *Kermes* large enough for their bodies to pass through, some apparently fail to make the exit holes quite large enough for the adults to leave their hosts, for several imagoes have been found dead in their retreats with their heads through the openings or with parts of their bodies through the exit holes (plate V. Fm), not being able to enlarge in the least the hole through the hard body-wall of the *Kermes*.

Supposed Occurrence in Galls.

At Corsicana, Navarro County, and at Bryan, Brazos County, Texas, some limbs of post oaks, *Quercus stellata* Wang., bore numerous specimens of *Kermes galliformis* Riley which were badly infested by this oecophorid parasite. They also bore numerous hymenopterous galls which resembled in size and shape the specimens of *Kermes*. Many of these galls contained clean-cut holes resembling in general appearance those made by *Euclemensia bassettella* (Clemens). In order to ascertain whether or not Bassett, as quoted by Clemens (1864), and Packard (1890*b*) were correct in their previous statements that this lepidopteron bred in galls, many of these galls were collected and enclosed in rearing cages. Some time in July several specimens of a large hymenopterous insect emerged from the gall material. Specimens sent to Dr. Howard on thirty-first of July were returned in early August with the following notes: "The insect which you considered to be a gall-maker is a species of *Callimome*, not a gall-maker, but a parasite on some gall maker. It is a Chalcidid of the family *Toryminae*, but undeterminable specifically. It is possible that it is a parasite of the *Euclemensia*."

The writers would refute this latter possibility, however, because the several hymenopterous galls were placed in separate rearing jars from the *Kermes* material, and from the gall material *Hymenoptera* alone emerged. Furthermore, there is no possibility of *Callimome* being a parasite of *Euclemensia bassettella* (Clemens) because the writers have never reared the lepidopteron from the galls nor have lepidopterous larvae

ever been found within these galls when they were dissected. In all cases various sized hymenopterous larvae were found after dissection of the galls. On the other hand, no *Hymenoptera*—not even *Callimome*—have ever been reared by the writers from any *Kermes* either in Missouri or Texas. All dissections of parasitized *Kermes* have shown lepidopterous larvae and never hymenopterous grubs.

Description.

The larva (plate V, A) is a whitish grub about five millimeters long and two millimeters in diameter at the fourth and fifth abdominal segments. The head and the first thoracic segment are chestnut-brown. The pro-thoracic segment is marked longitudinally with a narrow white line which continues along the vertex and down either side of the front to the margins of the clypeus. The pairs of short thoracic legs are edged with chestnut-brown. The pro-legs occur on the third, fourth, fifth, sixth and tenth abdominal segments, and are apparently not much developed. Each pro-leg has the crochets or hooks arranged in a uniordinal circle. Fracker (1917) gives as one of the characters of the *Oecophoridae*, the family to which *Euclemensia bassettella* (Clemens) belongs, the biordinal circle of crochets. Evidently *E. bassettella* (Clemens) is an "exception that proves the rule," for it has a clearly defined uniordinal arrangement. The body is but sparsely dotted with setae. The spiracles are small, brownish, and circular.

The pupa (plate V, B) is light brownish in general color, measuring about four millimeters in length and about two millimeters in diameter at its middle. The abdomen, in general, is a cream color, and the spiracles are distinctly marked with brownish. The dorsal terga are slightly chitinized with brown. The empty pupal case is a uniform yellow-brown.

Inasmuch as the original description of the adult is excellent and undoubtedly inaccessible to some readers, the writers have thought best to reproduce it verbatim (Clemens, 1864).

"Fore-wings bright reddish-orange, sometimes tinted with yellowish-orange, with a black spot at the base of the fold of the wing and a broad black stripe showing bluish or greenish reflections along the inner margin extending from the middle of the fold to the tip of the wing and occupying nearly one-half the breadth of it. Along the costa, about the middle of it, is a shining black stripe, which becomes narrower as it approaches the apical third of the wing. Cilia blackish. Hind wings shining, dark greenish-black. Head and thorax black. Antennae black. Labial palpi yellowish-orange." (plate V, C).

Chambers (1878) later notes color variation in *Euclemensia bassettella* (Clemens) ranging from "sulphur to almost brick-red."

Summary.

The writers desire to emphasize the following points:

(1) *Euclemensia bassettella* (Clemens) is a *Kermes* parasite and not a gall feeder as has been reported.

(2) *Euclemensia bassettella* (Clemens) larvae have habits differing from those of other *Kermes*-infesting *Lepidoptera.*

(3) There would appear to be but one generation of this lepidopteron a year.

(4) No parasites are known to attack any stage of this *Kermes* parasite.

(5) *Euclemensia bassettella* (Clemens) is undoubtedly more widely distributed than its records show.

(6) In a few cases this parasite has been abundant enough to materially reduce the coccids' numbers.

Literature Cited.

Britton, W. E., 1916. In 16th. Report of State Entomologist of Connecticut, for the year 1916. part 2.

Chambers, V. T., 1878. "Tineina," in Canadian Entomologist, X, pages 50-54.

Clemens, B., 1864. "N. A. *Micro-Lepidoptera,*" in Pro. of Ent. Soc. of Phil., II, pages 415-430.

Comstock, J. H., 1880*a*. "Notes on Predaceous *Lepidoptera,*" in Rpt. of U. S. Com. of Agr., 1880, pages 241-244.

Comstock, J. H., 1880*b*, "*Euclemensia bassettella,*" in do. page 245.

Dyar, H. G., 1902. "A List of N. A. Lepidoptera," in Bul. No. 52, U. S. Nat. Mus.

Fracker, S. B., 1917. "The Classification of Lepidopterous Larvae," in Ill. Bio. Mon., II, No. 1, page 85.

Grote, A. R., 1878. "Note on *Hamadryas,*" in Canadian Entomologist, X, pages 67-69.

King, G. B., 1899. "Cont. to the Knowledge of Mass. *Coccidae,*" in Canadian Ent., XXXI, pages 139-143.

Lawson, P. B., 1917. "The *Coccidae* of Kansas," in Bulletin of U. of Kans. Biol. Series, XVIII, No. 1, page 185.

Packard, A. S., 1890*a*. "Ins. Inj. to Forest and Shade Trees," in Fifth Rpt. of U. S. Ent. Com., page 100.

Packard, A. S., 1890*b*, do., page 220.

EXPLANATION OF PLATE V.

A—dorsal view of three larvae of *Euclemensia bassettella* (Clemens) (about x3)

B—dorso-lateral and ventral views of three euclemensid pupae (about x3)

C—dorsal view of imago with wings expanded (about x3), showing the relative and comparative sizes of the wings and the broad fringe of cilia.

D—lateral view of *Kermes pettiti* Ehrh. (about x14), showing oval exit hole of *Euclemensia bassettella* (Clemens). The upper half of this *Kermes* was pecked away by woodpeckers, leaving the covered "U-shaped" retreat shown in Fig. E.

E—*Kermes pettiti* Ehrh. (about x1) in situ on an oak twig; dorsal view of *Kermes* shown in Fig. D, showing the covered "U-shaped" retreat of a larva of this euclemensid parasite.

F—aggregation of three infested and one apparently uninfested *Kermes* (about x10), showing: (c) the silken coverings over exit holes and made by the larvae of *Euclemensia bassettella* (Clemens) but broken by the emergence of the adults; (m) an adult moth in the act of emerging from her *Kermes* host. However, this particular one died in the larval retreat, due to the fact that the larva had not cut a large enough exit hole through the body-wall of the host for the imago to escape from.

H—*Kermes pettiti* Ehrh. (about x1), showing: (a) group of specimens in Fig. F; and (b) a normal uninfested *Kermes*.

A new Species of Copaeodes (Lep.).

By HENRY SKINNER.

Copaeodes chromis n. sp.

Color of all wings deep chrome. Primaries have a brown border 2 mm. wide, which extends from near the middle of the costa to the middle of the inner margin. The stigma is a narrow line at the end of the discoidal and it runs parallel to the outer margin.

The secondaries have the costal margin brown.

Undersides same color as above and immaculate except for a small brown spot at the base of the primaries.

Head, thorax and abdomen deep chrome. Expanse 25 mm.

Described from one male (?) specimen from Colima, Mexico.

Type in the collection of The Academy of Natural Sciences of Philadelphia.. It resembles *procris* but the primary wings are more rounded and *procris* does not have bordered wings.

A Resurrected Paper on Mosquitos and Malaria (Diptera).

By Harry B. Weiss, New Brunswick, New Jersey.

Mr. George A. Osborn, Librarian of Rutgers College, recently called my attention to a paper entitled "The Mission of the Mosquito" by J. Suydam Knox, which appeared in Vol. I, 1873, of "Our Home, a Monthly Magazine of Original Articles, Historical, Biographical, Scientific and Miscellaneous," mostly by Somerset and Hunterdon County (New Jersey) writers on subjects largely pertaining to these counties, edited by A. V. D. Honeyman, attorney-at-law, Somerville, New Jersey.

Mr. Knox starts out by quoting Josh Billings on the mosquito and describes at length its method of securing a meal. He also states that during the summer of '67, while resident surgeon of one of the hospitals of the city of B., he determined to investigate the mission of the mosquito. Vast numbers of specimens were caught, their heads separated and macerated in alcohol.

"The tincture was then strained, boiled, filtered and set aside to cool. Slowly small white crystals formed on the bottom. They were evaporated to dryness and examined. Eureka, the question was solved. They were isomeric with quinine. Their chemical composition was the same, C 30 H 12 N O. 2. They presented the same fluorescent appearance when dissolved in water. The same reaction occurred in chlorine and ammonia. The sole difference was their influence on polarized light, producing deviation of the plane to the right instead of the left. The mission was found. The question of ages was answered. The mosquito carried in its sting the antidote to malaria."

After remarking upon the presence of mosquitos in districts where fever and ague prevailed, the results of further experiments are given as follows:

1. Blood was drawn from the arm of a patient and examined: a mere trace of quinine was found. Said patient was bribed to expose himself to mosquitos and then bled. Abundance of quinidia was found in the vital fluid.

2. Three patients, suffering from ague, were selected and placed in separate rooms. One was given a solution of quinine and rigidly excluded from mosquitos. The second received a solution of morphia, and was also excluded from the insects. The third received a similar

solution of morphia at night to induce sleep, and was freely bitten. The first and third recovered. The second still had ague. Here in the first case quinine cured as was expected. Of the other two, who took only morphine, he alone was cured who was freely inoculated with the virus of the mosquito.

3. With much care, sufficient of the chrystals of quinidia were obtained to make a saturated solution for experiment. And among the many ague patients of the hospital, twelve were chosen as near alike as possible in age, constitution and violence of disease. Six were treated with hypodermic injections of the solution of the virus and six with similar ones of solution of quinine. All twelve recovered. But those injected with the virus of the mosquito got well in one-third less time than the remaining six.

In "The Mosquitos of North and Central America and the West Indies" by Howard, Dyar and Knab, Vol. I, p. 188, under "Early Ideas," appears a statement, by Dr. Samuel W. Francis from his paper entitled "Curious Facts Concerning Man and Nature with a Few Practical Suggestions on Other Subjects," 1874, to the effect that in a previous work of his entitled "Life and Death," p. 210, Mar., 1871, mention is made that

"The time will come when it will be publicly acknowledged that the little fluid they (the mosquitos) inject into your blood contains certain specific properties for different diseases. To prove that I am right, let any skillful chemist test the powerful drop contained in a mosquito's sack and he will find many of the properties of Quinine."

The statements of both Knox and Francis are curious instances of a conclusion diametrically opposed to the right one having been drawn from practically the same premises.

In the "History of Hunterdon and Somerset Counties, N. J.," compiled by J. P. Snell, 1881, the following brief biographical account of J. Suydam Knox is given:

Born July 26, 1840, graduate of College of New Jersey, 1860; of Physicians and Surgeons, N. Y. City, 1866; City Hospital, Brooklyn, 1868; practiced in Somerville, N. J., from 1866 to 1873 when he removed to Chicago, and became lecturer and clinical professor in Rush Medical College.

Change of Address.

I am giving up my position as Curator of the Barnes Collection to accept a post in the Entomological Branch of the Department of Agriculture at Ottawa, Ontario. I expect to commence my new duties April 1st.—J. McDUNNOUGH.

Two Species of Phylloxera from California (Hemiptera; Aphidae).

By G. F. Ferris, Stanford University, California.

The western portion of the United States appears to be very poorly supplied with species of *Phylloxera*. Aside from the notorious pest of the vine there appear to be but two species known from California, Davidson having recorded *P. popularia* Pergande from poplars and *P. salicola* Pergande from willow. I am here describing an apparently new species from oak, perhaps the first to be recorded from oak west of Missouri, and am presenting some notes upon one of the other species.

Phylloxera stanfordiana n sp. (Text figs. B, D.)

In life. Occurring upon the twigs of the host, concealed beneath any chance covering, especially numerous under the twig-encircling egg masses of a moth, (possibly *Malacosoma disstria.*) Entirely destitute of any secretionary covering; of a light yellow color.

Apterous female. Length (flattened on slide) .75 mm. Shape somewhat pyriform. Dorsum entirely destitute of pores, bearing a few very minute spines, of which those on the head are borne upon slight prominences. Derm minutely roughened in the cephalic region, elsewhere quite smooth. Beak reaching somewhat beyond the posterior legs, five-segmented. Antennae with the third segment somewhat longer than the other two combined and rather prominently annulated; sensoria, if present at all, borne at the extreme tip of the third segment. Abdominal spiracles apparently lacking.

Type host and locality. From *Quercus douglasii,* on the campus of Stanford University, California; Sept. 10, 1918. Collected by the author. *Holotype* and paratypes in the Stanford collection.

Notes. This probably belongs to the group of *P. rileyi* and *P. querceti,* but the almost obsolete dorsal tubercles and the absence of a conspicuous sensorium on the third antennal segment separate it at once. Attention should be called to the apparent absence of abdominal spiracles. I find the same condition in specimens of what I take to be *P. rileyi* and in the species later to be discussed in this paper as *P. salicola.* In *P. vastatrix* the abdominal spiracles are certainly present.

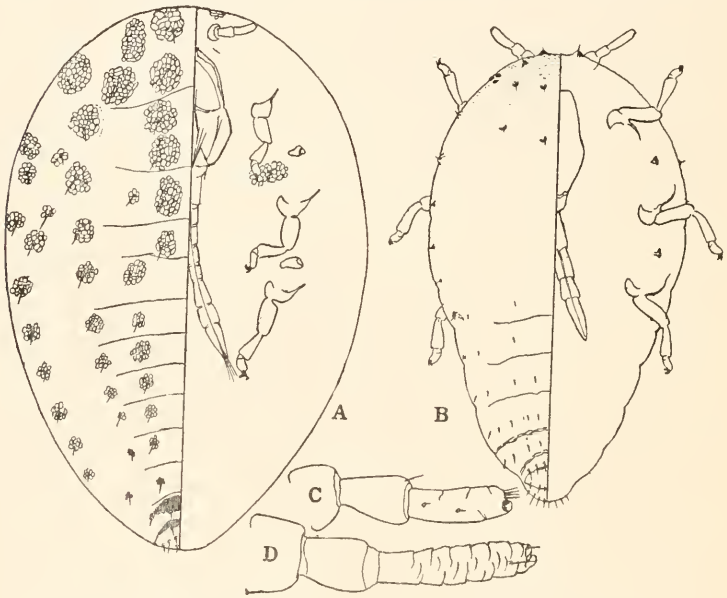
Phylloxera salicola Perg.? (Text figs. A, C.)

1904. *Phylloxera salicola* Pergande, Proc. Davenport Acad. Sci., Vol. 9, pp. 267-69, pl. XXI, figs. 161-168.

1015. *Phylloxera salicola* Perg.; Davidson, Jn. Ec. Ent., Vol. 8, p. 419, pl. 25.

In life. Exposed upon the bark of the host, chiefly on the smaller twigs. Entirely covered with wooly, white secretion.

Apterous female. Length (flattened on slide) .9 mm. or less. Shape regularly oval, slightly more pointed posteriorly. Dorsum with numerous areas of pores, these arranged in three more or less definite, longitudinal rows. Each cluster of pores is grouped around a small spine,



A, C.—*Phylloxera salicola* Pergande (?); apterous female and antenna of same. Specimen from *Populus trichocarpa*.

B, D.—*Phylloxera stanfordiana* n. sp.; apterous female and antenna of same. All figures drawn to same scale.

the clusters on the head being largest, the others becoming progressively smaller posteriorly. Derm otherwise smooth, not at all roughened or beset with fine points. Last two segments each with a small, transverse, chitinized area. Ventrally there is a small cluster of pores behind each of the first pair of spiracles. Antennae short, the third segment about as long as the other two combined, annulations few and

very faint, extreme tip apparently with a small sensorium. Beak reaching somewhat beyond the posterior legs, eight-segmented. Abdominal spiracles apparently lacking.

Hosts. From *Populus trichocarpa* and *Salix* sp., San Francisquito Creek, near Stanford University, California, and from *Populus candicans,* Salt Lake City, Utah, (R. W. Doane, coll.).

Notes. I am inclined to regard it as somewhat doubtful that this is really *P. salicola* Perg. The original description lacks definiteness in regard to the most important details and the figure is somewhat impressionistic but it is obvious that the species at hand is at least close to *salicola.* It certainly is not *P. popularia* Pergande as the latter is described and figured as having the dorsum thickly beset with minute points. The description and figures here presented, will, it is hoped, aid in clearing the matter up.

I am entirely unable to separate the specimens found on poplar from those found on willow, the only visible difference being that the abdominal groups of pores are perhaps a trifle larger in the specimens from the latter host. In the specimens from poplar in Utah, this difference is quite noticeable, the number of pores in all the groups being much reduced, some of those toward the posterior end of the abdomen being entirely lacking.

It may be noted that the above descriptions are based upon carefully stained material.

The Naiad of the Odonate Genus Coryphaeschna.

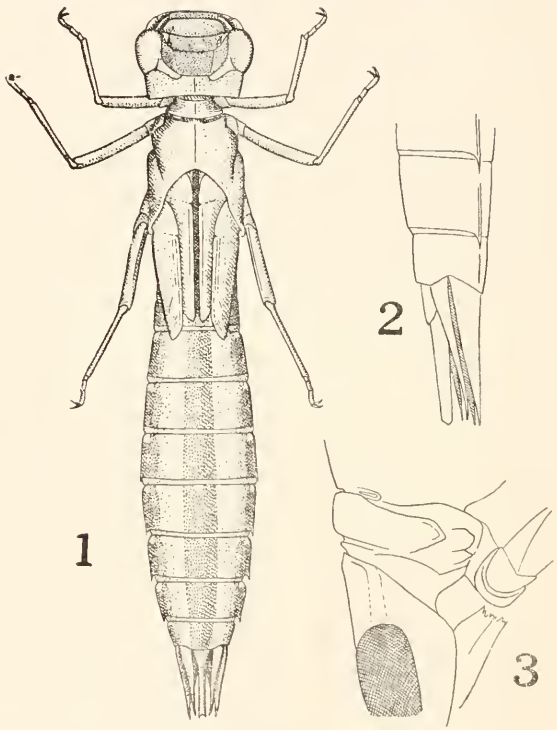
By Clarence Hamilton Kennedy, North Carolina State College, West Raleigh, North Carolina.

Recently while examining Mr. Brimley's collection of interesting southern Odonata the writer was shown among other immature specimens the largest aeshnine naiad* he had ever seen—a regular behemoth of a naiad. Mr. Brimley believed

*See Comstock. Ann. Ent. Soc. Amer., 1918, vol. XI, pp. 222-224. I have adopted Prof. Comstock's term for the immature state of the Odonata. It is a most happy term for distinguishing the immature stages of the aquatic orders.

it to be *Coryphaeschna ingens*, but very kindly suggested that the writer try to identify it more definitely and describe it.

This specimen was taken by Mr. Brimley, May 26, 1908, at Lake Ellis, Craven County, which is in the lowlands of southeastern North Carolina. It was found on the shores of the lake and had died in the act of emergence, for the skin had



Coryphaeschna ingens naiad.

Fig. 1.—Dorsal view, natural size.
Fig. 2.—Lateral view of appendages.
Fig. 3.—Lateral view of prothorax showing the lateral process of the middle lobe and the supracoxal processes.

split and the thorax protruded in a large hump, but no part of the imago had been withdrawn from the naidal skin. The genus was determined by removing a wing pad and boiling the crumpled wing in caustic potash while the species was checked by elimination as no other species in the genus has been re-

corded so far north, and by the shape of the appendages which were fully expanded within the abdominal skin, as good fortune had let this be a male. The following is the description:

Total length 65 mm., abdomen 44 mm., hind femur 8 mm.; width of abdomen 10 mm.

Body elongate, slender, smooth; a narrow sharply defined stripe down the middorsal line of the abdomen, a lateral stripe twice the width of the dorsal stripe above each lateral keel; legs probably obscurely banded in life.

Head slightly concave behind, its posterior margin being a thin edge; the hind angles are almost right angles, obtuse but well defined and not rounded, neither do they carry any spines or other armature; sides of head straight, diverging cephalad slightly, three-fifths as long as the eye. The labium is missing, but from the very flat under surface of the head it is wide anteriorly and from the shape of the submentum extends at least posterior to the first coxae. Antennae seven-jointed, minute.

Prothorax with the median lobe terminating laterally in a prominent, obtusely rounded point which is larger than either supracoxal process; posterior supracoxal process more than twice the size of the anterior one, its point rounded. In life probably the hind wing pads extend to the apex of abdominal segment 3. The legs are noticeably small for so large a naiad because when these are extended the claws of the hind leg reach only to the middle of segment 5.

Abdomen widest at segments 5-7, whence it tapers regularly cephalad to segment 1, which is two-thirds as wide, and caudad to segment 10, which is one-half as wide. Segment 10 is one-half as long as either segment 5 or segment 6. There are lateral spines on segments 6-9, but all are small, slender and acute, those on segment 6 being minute and easily overlooked. The superior appendage and ventral paired appendages are equal in length and two and one-third times as long as segment 10. The dorsal paired appendages are subequal to the others and very slender. The superior appendage is slender, widely cleft at the apex and has a single, dorsal tubercle directed caudad placed at one-third of the distance from base to apex.

This naiad resembles those of the genus *Aeshna* in the majority of its characters, especially in having lateral spines on segments 6-9 and in having a single tubercle on the superior appendage of the male. It differs from the known naiads of the North American Aeshnas in having the dorsal paired appendages with their length scarcely less than that of the others

and in having the posterior angle of the head thin-edged and more angulate than in any described *Aeshna*. It differs from *Anax* in the small eye, the angulate head and in having, in this male skin, but a single tubercle on the superior appendage where there is a pair in the latter. It differs from *Boyeria, Nasiaeschna, Basiaeschna* and *Epiaeschna* in having the appendages all of approximately equal length.

The specimen described has been deposited in the Academy of Natural Sciences of Philadelphia, Pa.

Descriptions of New Species of Coleophora (Microlepidoptera).

By Annette F. Braun, Cincinnati, Ohio.

The following paper contains descriptions of a number of species of *Colcophora* reared by the writer. Of these here described, one, *C. viburniella* Clemens, was previously named from case and larva. *C. cretaticostella* Clemens was described from flown specimens, without knowledge of the life history. The remaining five are described as new. As far as the writer can determine from comparison with published descriptions of species taken only in the imaginal state, none of these has been described before. It has not been possible to make a comparison with types. In connection with the matter of types, it may be well to call attention to some remarkable statements of Chambers made in "Correspondence" with the Canadian Entomologist (Vol. IX, pp. 38-40). Here, after remarking that he seldom took the trouble to pin and spread common species at all, Chambers makes this statement: "But a few years ago I began to make a collection to be preserved as types of all my species. These were all pinned and spread. Unfortunately, during my absence in Colorado, the greater part of this collection was destroyed. One or more specimens of the greater number of species were fortunately preserved, and most of the other species can be supplied. This collection is now in the Cambridge Museum. It contains types—pinned and spread—of something over 200 species." It may well be

doubted whether in a genus such as *Coleophora,* where the species require such careful discrimination, Chambers' types always represent the actual species described. Only where the type is in the best condition of preservation, could most species be determined with certainty. It is not, therefore, in my opinion, advisable to withhold from publication descriptions of species whose life history is known, because the certainty of future easy determination of such species will far outweigh any disadvantage occasioned by the possible creation of synonyms.

Coleophora apicella n. sp.

Head shining brassy; palpi simple; basal four-fifths of the antennae black slightly thickened with scales, apical fifth silvery white, with each segment marked beneath with a minute black spot. Thorax brassy. Fore wings lustrous brassy at the extreme base, shading outwardly into reddish bronze or deep blue according to the light. Hind wings, legs and abdomen dark brown, with a slight brassy lustre. Expanse: 9.5-11 mm.

Locality: Cincinnati, Ohio. *Type* (♀) and paratypes (two males, seven females) in the writer's collection.

The larval cases are found on the lower side of the rosette leaves of the fire pink (*Silene virginica* L.). The summer case, which is spun entirely of grayish silk, is cylindrical, three-valved at apex, with mouth scarcely or not at all deflexed. This case is gradually enlarged during the summer, but retains its general shape until the following spring, when the larva resumes feeding on the overwintering leaves. In the formation of the mature case, the overwintering case is split open and may be distinguished as a darker gray patch occupying about one-half the dorsal surface of the completed case. The mature case is cylindrical, 7 to 9 mm. long, with slightly deflexed mouth, the silk between the mouth and the old part of the case roughened and wrinkled transversely; it tapers somewhat posteriorly, flaring again to form the conspicuously three-valved apex. The larvae feed until about the middle of May; imagos, May 31 to June 10.

The moth is distinguished from the other bronzy metallic species by the silvery apical fifth of the antennae.

Coleophora viburniella Clemens.

Coleophora viburniella Clemens, Proc. Ent. Soc. Phila., I, 79, 1861; Tin. No. Am., 167, 1872.

This species was originally named from larva and case; the characteristic case described by Clements renders its recognition certain. Three cases with larvae feeding on black haw (*Viburnum prunifolium* L.) were collected August 27, in Clermont County, Ohio. From these one moth was reared, emerging May 30 of the following year. The description of the imago follows.

Head white, slightly tinged with yellow; palpi white with a little fuscous on the under side. Antennae with the basal segment enlarged with a yellowish white tuft projecting in front and a little at apex; stalk white, annulate with dark brown.

Thorax and base of fore wings whitish. The wings shade into straw color, which becomes deeper toward apex and slightly coppery-tinged. Hind wings grayish, toward the apex becoming concolorous with the fore wings. Legs white. Abdomen white beneath, grayish yellow above and fuscous along the mid-dorsal line. Expanse: 11.5 mm.

Three cases are cut from the leaf; the first cut from a mine in the middle of the leaf, the second and third from the margin of the leaf. Before forming the second case, the first is attached at the margin of the leaf, from which the larva mines into the leaf, and then cuts out a triangular piece of leaf, of which the angle projecting into the leaf forms the mouth, the other angles of the triangle at the leaf margins forming the projections "near the hinder end above and below" of which Clemens speaks. The third case is formed likewise by the addition of a triangular piece of mined leaf, similarly cut. Here, however, the second case is attached very near the long very oblique cut which forms the lower edge of the case. The upper edge of the case is formed of a shorter slightly oblique cut and the serrated margin of the leaf (the two remaining sides of the triangle); the resulting pointed flat projection constituting the "flattened wing-like appendage." The surface of the case is doubly convex in a line from mouth to apex, the projections on each side remaining flat. Length of case 10 mm.; height of wing-like appendage above the case 2.5 mm.

When collected, the larvae were in process of constructing the last case, and continued to feed for about six weeks.

Coleophora cretaticostella Clemens.

Coleophora cretaticostella Clemens, Proc. Acad. Nat. Sci. Phil., 1860, 5; Tin. No. Am., 89, 1872; Chambers, Can. Ent., VII, 124, 1875; X, 112, 1878; Busck, Proc. Ent. Soc. Wash., V, 192, 1903.

I have eleven specimens reared on blackberry, two captured specimens from Cincinnati and one captured specimen from Bedford, Massachusetts, which I refer to this species. The general ground color is a shining ocherous, deepest in the apex and along the border of the broad white costal streak, becoming much paler, and in worn specimens whitish toward the dorsal margin. It is only somewhat worn specimens which show the streaking with ocherous, really due to the slight abrasion of the surface along the veins. The scales thickening the basal segment of the antennae form, in perfect specimens, a tuft projecting not only in front but for the length of two segments at the apex.

The cases are found on the under side of leaves of blackberry, the larvae mining into the leaves during late summer and fall, and in the spring feeding on the young leaves which they skeletonize in irregular patches. Four cases are cut from the mined leaf, of which the third and fourth show on the dorsal edge the serrations of the margin of the leaf. Usually a portion of the earliest case and often part of the second are lost before the fourth piece of leaf is added. In cutting this last portion of the case, the preceding case is attached on the under side of the leaf near the margin so that when first constructed, this portion of the completed case is not in a line with the earlier portion. The larva winters in this case, which is at this time flattened, with the separate leaf fragments of which it is constructed easily distinguishable, and shows the leaf serrations along its upper edge; the lower edge is undulating with a distinct projection marking the hind end of the last leaf fragment. The case becomes much worn during the winter, and where the larvae winter on the food plant in the open, the serrations on the dorsal edge, and often much of the leaf covering of the case are worn off. In the spring the case is rounded out, further strengthened with silk which may partially cover the worn leaf surfaces, so that the mature case often bears slight resemblance to the case of the fall before. This case is evenly curved backward on its dorsal surface; on

the under surface there is a slight hump about two-thirds from the mouth, behind which the case narrows abruptly to the rather pointed two-valved apex.

The moths appear from May 30 to June 10; the Massachusetts specimen is dated June 20.

(To be continued.)

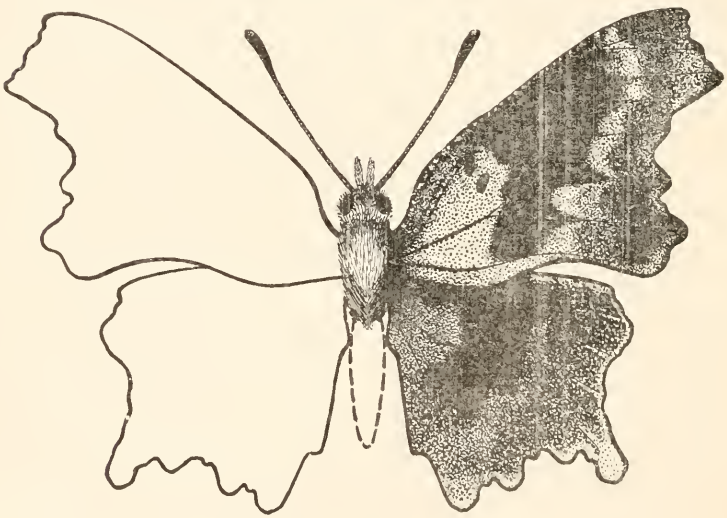
An Aberration of Polygonia progne (Lepid.).

By Laurence V. Coleman, Jamaica Plains, Boston, Massachusetts.

Polygonia progne, ab. nov. **martineae.**

Expanse—54 millimeters.

Upper Side—Primaries have the usual ferruginous marginal band and submarginal patch at the inner angle suffused, forming a broad marginal band of ferruginous, dusted along the margin with greyish



Polygonia progne, aber. nov. *martineae.*

lilac scales which are most numerous near the apex and at the inner angle. Within the ferruginous border is a narrow irregular band extending the entire width of the wing. Its anterior third is pale yellow, which shades posteriorly into the fulvous ground color of the normal form. The discal area of the wing is occupied by a large, subtriangular, rich ferruginous patch, extending from the costa almost

to the inner margin. Its inner boundary forms an obtuse angle, while its emarginate outer edge encroaches deeply upon the narrow fulvous band where it is crossed by the two branches of the cubitus vein. The basal area is of the typical fulvous ground color, which also extends narrowly along the inner margin of the wing to join the fulvous submarginal band. The center of the discal cell is marked by the two usual spots. The costa is concolorous with the broad marginal band. *Secondaries* are of a rich ferruginous color shading into well defined greyish lilac along the costal and outer margins and on the tail. The fulvous basal area and submarginal band of the primaries are continued faintly on the secondaries. The dark color between these bars gives the wings a general appearance of being crossed by a single dark band on a slightly lighter field.

Under Side—The pattern and colors are essentially normal except in a few minor respects. *Primaries* have the contrast between light and dark areas less marked than normally, and the entire pattern is somewhat dulled. The usual dark band along the posterior two-thirds of the outer margin is widened, and the greenish metallic crescents along the inner border of this band are enlarged. *Secondaries* show much less contrast between light and dark areas than do the primaries, but more than do the normal secondaries. The greenish crescents, tho indistinct, are present, and are spaced from the margin to correspond with those in the primaries. The abnormally heavy silver mark is striking. Its vertical limb is 0.5 mm. wide, while its horizontal one tapers from the same width to a point. Each limb is 1.7 mm. long.

Type—Catalog No. 5500. Peabody Museum, Yale University.

One female without data. The specimen was probably captured in Connecticut, for it was pinned with miscellaneous material from that locality.

"Seventeen Year Grasshoppers."

It is predicted that we are to have the 17-year locusts this summer. This brood of insects have been lying 15 or 20 feet under ground for the past 17 years and now their long sleep is about to end, and when the spring is full on its way the air will resound with their music. This insect is popularly supposed to be a locust, but it is not so. It is a grasshopper, the same that riddled Kansas and other green spots years ago. These interesting insects emerge from the ground at the same moment, betake themselves to trees and ferns, raise their families in a few weeks of aviation and song, then drop to earth, reoccupy their old haunts and resume their slumber for another 17-year period. While mingling with terrestrial scenes they eat up everything they can lay their mouths to and at the same time enjoying a delightful cabaret with their feasting. Of course these grasshoppers will wear a big W on their wings, which always means war. But this a new age and the choir may not appear."—*Newspaper.*

ENTOMOLOGICAL NEWS.

PHILADELPHIA, PA., APRIL, 1919.

Swat the Fly Versus Starve the Brute.

This is the time of year when we think of many problems in relation to domestic animals and plants. There is a renewed effort to increase the egg-laying capacity of the domestic hen and to decrease the activity of the cootie. The house-fly is a domesticated animal and many so-called sanitarians are waging a war on this dipteron on account of its disease-transmitting proclivities. The cry has been taken up to "swat the fly," and so far as we know the word "swat" was coined by a Kansan who used the term to sell illustrated postal cards. The numbers of *Musca domestica* in a community form a rather exact index of the amount of fermenting and decomposing vegetable and animal matter that has become derelict and misplaced, and if one pair of flies, barring accident, will produce billions of progeny in a single season, their early stages would eat millions of pounds, or thousands of tons, of filth. It is quite possible that this material is a distinct menace to health and man should do his own scavenger work and not shove it on to the proboscis of the poor fly. Buzzards and vultures would not be tolerated and protected as scavengers if they came into our houses and visited the cream pitcher and the butter plate. It is time for our sanitarians to get busy, have all filth removed from cities once a week and starve the fly, and then there would be more time to study the nidification of the hen. The fly swatter could also be relegated to the museum as a curiosity.—HENRY SKINNER.

Crabro montanus Cresson. (Hym.).

Strand, in Archiv für Naturgeschichte, 1916, p. 98, points out that *Crabro montanus* Cresson, 1865, is a homonym of *C. montanus* Gistel 1857, and proposes for Cresson's species the new name *montivagans*. It is hard to understand why he did not at least look in Dalla Torre's catalogue, where he would have found the available name *Crabro cristatus* Packard. In our modern nomenclature, the species will be *Solenius cristatus*.—T. D. A. COCKERELL, Boulder, Colorado.

Capture of Ants by Gummy Exudations (Hym.).

A number of years ago I observed that certain ants (*Myrmica brevinodis*) were attracted by the gummy exudations of broken sunflower stems and, attempting to eat the sticky juice, were snared and finally perished. A specimen showing this was figured and discussed by Wheeler in Bull. Amer. Mus. Nat. Hist., XXII, p. 417. I then surmised that the ants being essentially boreal and the sunflowers austral, there was maladjustment where the ranges overlapped, owing to the relatively short time since the organisms occupied the same area. Dr. Wheeler was skeptical, and a new case which has just come to hand can hardly be explained in the manner suggested, since both types concerned are characteristic of the arid plains. Mr. E. Bethel sends a specimen of the plant *Lygodesmia juncea*, collected at Denver, on which are several workers of *Pogonomyrmex occidentalis*, with their mandibles firmly fixed in the yellow gum. The gum exudes freely from the plants and the ants are caught and die, quite unable to escape. Mr. Bethel assures me that many ants are killed in this way.—T. D. A. Cockerell, Boulder, Colorado.

Entomological Literature.

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded.

The numbers in Heavy-Faced Type refer to the journals, as numbered in the following list, in which the papers are published.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of papers containing new species are all grouped at the end of each Order of which they treat. Unless mentioned in the title, the number of the new species occurring north of Mexico is given at end of title, within brackets.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

4—Canadian Entomologist, London, Can. **6**—Journal of the New York Entomological Society. **8**—The Entomologist's Monthly Magazine, London. **9**—The Entomologist, London. **10**—Proceedings of the Entomological Society of Washington, D. C. **11**—Annals and Magazine of Natural History, London. **12**—Journal of Economic Entomology, Concord, N. H. **17**—Lepidoptera, Boston, Mass. **19**—Bulletin of the Brooklyn Entomological Society. **23**—Bolletino del Laboratorio di Zoologia Generale e Agraria, Portici, Italy. **54**—Proceedings of the Biological Society of Washington, D. C. **68**—Science, Lancaster, Pa. **69**—Comptes Rendus, des Seances de l'Academie des Sciences, Paris. **79**—Bulletin of .

the Museum of Comparative Zoology at Harvard College, Cambridge, Mass. **82**—The Ohio Journal of Science, Columbus. **83**—Proceedings of the Royal Physical Society, Edinburgh. **84**—Boletin de la Sociedad Aragonesa de Ciencias Naturales, Zaragoza. **85**—The Journal of Experimental Zoology, Philadelphia. **86**—The Quarterly Journal of Microscopical Science, London. **87**—Arkiv for Zoologi, K. svenska vetenskapsakademien, Stockholm. **88**—Occasional Papers of the Museum of Zoology, University of Michigan, Ann Arbor.

GENERAL. Ball, E. D.—Economic entomology—its foundations and future. **12**, xii, 24-35. Foa, A.—L'epitelio dell'intestino medio nel baco da seta sano e in quello malato di flaccidezza. **23**, xii, 217-44. Gibson, E. H.—Relation of the systematist to the economic worker. **19**, xiv, 1-3. Giulio, C.—Osservazion sull'influenza della tiroide sullo sviluppo degli insetti (Atti. Reale Ac. d. Lincei, 1918, 376-9). Hampson, G. F.—Systematic papers published in the German language. **68**, xlix, 193. Johnson, C. W.—Insect collections of a museum. (Museum Work, Am. Assoc. Mus., Providence, R. I., i, 154-8.) Leng, C. W.—History of the New York Entomological Society, 1893-1918. **6**, xxvi, 129-33. Longinos Navas, R. P.—Insectos Chilenos. **84**, xvii, 212-230. Nicholson, C.—Sugaring. **9**, 1919, 43. Slosson, A. T.—Reminiscences of the early days of the New York entomological society. **6**, xxvi, 134-7. Torre Bueno, J. R.—The far flung field of entomology. **19**, xiv, 24.

PHYSIOLOGY, GENETICS, ETC. Castle, W. E.—Is the arrangement of the genes in the chromosome linear? The linkage system of 8 sex-linked characters of Drosophila virilis. (Proc. Nat. Ac. Sci. of U. S., v, 25-36.)

MEDICAL. Hutchison & Pierce—Studies on the dry cleaning process as a means of destroying body lice. **10**, xxi, 8-20. Pierce, W. D.—Some new phases of the entomology of disease, hygiene and sanitation brought about by the great war. **12**, xii, 42-9.

ARACHNIDA AND MYRIAPODA. Barrows, W. M.—Taxonomic position of Mysmena bulbifera (Glenognatha bulbifera) with some observations on its habits. **82**, xix, 210-12.

NEUROPTERA. Williamson, E. B.—Archaeogomphus, a new genus of dragon-flies [from Colombia]. **88**, No. 63.

ORTHOPTERA. Caudell, A. N.—Palmodes praetans and its prey. **10**, xxi, 40. Pantel, J.—La calcium dans la physiologie normale des Phasmides: oeuf larve eclosante. **69**, clxi, 127-9.

Davis, W. T.—A new Stagmomantis from Florida. **19**, xiv, 4-7.

HEMIPTERA. Baker, A. C.—Identity of Smynthurodes betae. **10,** xxi, 36-8. Muir, F.—Some new [neotropical] American Delphacidae. **4,** 1919, 35-9.

Davis, W. T.—Mississippi cicadas, with a key to the species of the southeastern U. S. [1 new]. **6,** xxvi, 141-55. Knight, H. H.—Male of Lygus univittatus with the description of a new Lygus. **19,** xiv ,21-2. McAtee, W. L.—Note on nearctic Heteroptera [2 new]. **19,** xiv, 8-16.

LEPIDOPTERA. Ehrmann, G. A.—New tropical American Papilios. **17,** iii, 10-11 (cont.). Forbes, W. T. M.—Guenee's Herminidae revived. **6,** xxvi, 224-5. Kaye, W. J.—New South American butterflies. **11,** iii, 215-18. Prout, L. B.—New and insufficiently known moths in the Joicey collection [some neotropical]. **11,** iii, 165-90. Unzicker, R.—Notes on Basilarchia astyanax var. albofasciata. **17,** iii, 9-10.

Franck, G.—Papilio cresphontes, var, maxwelli, nov. **19,** xiv, 3.

DIPTERA. Bezzi, M.—Ulteriori notizie sul gen. Himantostoma Lw. **23,** xii, 272-4. Brues, C. T.—The Phoridae of Grenada. **79,** lxii, 499-506. Edwards, F. W.—Some parthenogenetic Chironomidae. **11,** iii, 222-8. Keilin, D.—On the structure of the larvae and the systematic position of the genera Mycetobia, Dityomyia, Symmerus. **11,** iii, 33-42. Riley, W. A.—Occurrence of Drosophila larvae and puparia in bottled milk. **12,** xii, 41. Stark, M. B.—An hereditary tumor. **85,** xxvii, 509-22. Townsend, C. H. T.—Note on Leskiine synonymy. **10,** xxi, 20. Wallis, E. F.—The "singing" of Syrphus ribesii while at rest. **8,** 1919, 33.

Johnson, C. W.—North American D. described by Nils S. Swederus [1 n. name]. **4,** 1919, 32. Malloch, J. R.—One new genus and two n. sps. of Anthomyiidae from the vicinity of Washington, D. C. **54,** xxxii, 1-4.

COLEOPTERA, Aurivillus, C.—Neue oder wenig bekannte C. longicornia [some neotropical]. **87,** x, 355-60. Blatchley, W. S.—Home of Hormops and its proper position among other Rhynchophora. **6,** xxvi, 155-61. Burke, H. E.—Biological notes on some flat-headed bark borers of the genus Melanophila. **12,** xii, 105-8. Claycomb, G. B.—Notes on the habits of heterocerous beetles. **4,** 1919, 25. Hayes, W. P.—Life-cycle of Lachnosterna lanceolata. **12,** xii, 109-117. Huie, L. H.—The bionomics of the tiger beetle (Cicindela campestris). **83,** xx, 1-11. Munro, J. W.—The genus Hylastes, and its importance in forestry: a study in scolytid structure and biology. **83,** xx, 123-53. Nicolay, A. S.—A list of the Buprestidae and Cerambycidae taken on Long Island, N. Y. **19,** xiv, 17-20 (cont.). Notman, H.—Borcaphilus, a genus of staphyli-

nid C. new to No. America [1 new]. **6,** xxvi, 182-89. **Razzauti, A.**—Contributo alla conoscenza del tonchio del faginolo (Acanthoscelides obtectus). **23,** xii, 94-122. **Sharp, D.**—Studies in Rhynchophora. VI. "The New York weevil." **6,** xxvi, 215-18.

Fall, H. C.—New No. American species of Apion [7 new]. **6,** xxvi, 218-23. **Fisher, W. S.**—Note on Macrobasis murina. A new gen. and sp. of Cerambycidae from Colorado. **10,** xxi, 1-2; 38-40. **Leng, C. W.**—A new race of Cicindela, with notes on other races and species. Notes on some changes in the list of C. **6,** xxvi, 138-41; 201-11. **Pierce, W. D.**—Contribution to our knowledge of the weevils of the superfamily Curculionoidea [new gen. & families]. **10,** xxi, 21-36. **Schaeffer, C.**—On some genera and species of the family Ostomidae [12 new]. Miscellaneous coleopterological notes and descriptions [4 new]. **6,** xxvi, 190-201; 211-14. **Van Dyke, E. C.**—Review of the species of the coleopterous genus Silis, which are found in America, north of Mexico [7 new]. A new gen. and sp. of cave-dwelling carabidae from the U. S. **6,** xxvi, 161-79; 179-82.

HYMENOPTERA. Bequaert, J.—Identity of Evania urbana, 1908, and E. punctata, 1832. **19,** xiv, 23. **Cockerell, T. D. A.**—Descriptions and records of bees [some neotropical]. **11,** iii, 118-25; 191-98. **Imms, A. D.**—Observations on the insect parasites of some Coccidae. **86,** lxiii, 293-374. **MacGillivray, A. D.**—Leucopelmonus confusus. **4,** 1919, 33-5.

Cockerell, T. D. A.—[Four] new and little known American bees. **4,** 1919, 26-8. **Gahan, A. B.**—A new gen. of chalcid-wasp belonging to the family Eulophidae [1 new sp.]. **10,** xxi, 2-4. **Rohwer, S. A.**—Descriptions of 3 parasites of Agrilus angelicus. **10,** xxi, 4-8. **Roman, A.**—Ichneumoniden aus West-Groenland [2 new]. **87,** x, No. 22.

Doings of Societies.

Entomological Section of The Academy of Natural Sciences of Philadelphia.

Meeting of November 21, 1918. Director Philip Laurent in the chair, ten persons present. The death of Mr. Erich Daecke, an Associate, was announced.

Mr. Rehn called attention to the valuable work being done by C. D. Sherborn in establishing the dates of issue of many of the works of early authors which were issued in parts.

Hymenoptera. Mr. Cresson exhibited a nest of small bees found in a dye-wood log from Tehuantepec, Central America. Mr. Rehn

spoke of the work of Dr. Bequaert in the Belgian Congo, especially his Revision of the Vespidae from that region. The speaker called attention to the homely but expressive remarks regarding the similarity in the different color phases existing in the wasps of widely separated genera. The peculiar structure observed at the base of the abdomen of some species, which Dr. Bequaert termed acarid cavities, was commented on by the speaker.

Lepidoptera. Mr. Laurent exhibited a series of 15 female specimens of *Eurymus (Colias) philodice*, collected at Mt. Airy, Philadelphia, which showed great variation in the presence and absence of yellow scales in the black border of the anterior wings. Specimen No. 1 has the border entirely black without a yellow scale, while No. 15 has nearly as much yellow as black.—E. T. Cresson, Jr., *Recorder*.

Feldman Collecting Social.

Meeting of December 18, 1918, at the residence of H. W. Wenzel, 5614 Stewart St., Philadelphia. Nine members present, Mr. Ernest Baylis, of this city, and Mr. Edgar Vandermark, of Falls Church, Va., visitors. Pres. H. W. Wenzel in the chair.

Coleoptera. Mr. Baylis exhibited some specimens he had collected, among the rare forms being: *Toxotus cylindricollis* Say, Pocono Lake, Pennsylvania, VII-31, *Acmaeops thoracica* Hald., Castle Rock, Pennsylvania, IV-16, and *Buprestis ultramarina* Say, Clementon, New Jersey, V-16. Dr. Castle exhibited a specimen of *Platynus larvalis* LeC. from Uniontown, Pennsylvania, IX-20, and an unnamed allied species from Port Columbia, Washington, VI-29-15; also a heavily marked race of *Cicindela hirticollis* Say from Kent Island, Maryland, VI-30.

Diptera. Mr. Hornig exhibited specimens illustrating life histories of nine species of local mosquitoes.

Lepidoptera. Mr. Laurent exhibited a number of Lepidoptera collected by Mr. H. W. Wenzel, among which was a specimen of *Plusia balluca* Geyer from West Philadelphia, VIII-20. The speaker stated that this was one of the most beautiful as well as one of the rarest Plusias found locally.

The 31st annual meeting was held January 15, 1919, at the same place. Eleven members were present. Messrs. H. B. Kirk and Josef N. Knull, of Harrisburg, Pennsylvania, visitors; Pres. H. W. Wenzel in the chair.

The President read his annual address, which was ordered to be incorporated in the minutes.

The present officers were re-elected to serve for 1919 and are as follows: *President*, H. W. Wenzel; *Vice-President*, Wm. S. Hunt-

ington; *Treasurer*, H. W. Wenzel; *Secretary*, Geo. M. Greene, and *Assistant Secretary*, J. Wagener Green.

Coleoptera. Messrs. Kirk and Knull detailed some of their methods of rearing Cerambycidae in the state insectary. Mr. Hornig exhibited a specimen of *Carabus nemoralis* Mull. which he collected in Germantown, Philadelphia, X-15-18. Dr. Castle exhibited from Uniontown, Pennsylvania, *Scaphinotus viduus* Dej., VII-10 to VIII-27, *S. germari* Chaud. VII-20 to VIII-25 and *S. ridingsii* Bland VII-10 to VIII-15. Mr. H. A. Wenzel spoke of sieving material collected from a swamp at Upper Darby, Delaware County, Pennsylvania, 1-5-19, and finding *Dicera pugionata* Germ. (previous records of which were beating alder in June and July) and *D. lurida* Fabr.; he was surprised to find them hibernating.

Orthoptera. Mr. Huntington mentioned a man from Sewell, New Jersey, who trapped roaches in his house by placing a sponge soaked with vinegar, over which was spread sugar and grated onions, in a screen trap which was placed in a dark room and proved a great success.

Diptera. Mr. Hornig said he had had a complaint from a house that many small flies were in the dining-room and found they were *Drosophila* in great numbers, but was unable to find the manner in which they bred.—Geo. M. Greene, *Sec'y*.

Ohio Entomological Workers.

The Annual State Meeting of Entomological Workers in Ohio Institutions was held in the Botany and Zoology Building, Ohio State University, Columbus, Ohio, on Thursday, January 30, 1919.

Brief addresses were made by Raymond C. Osburn, Head, Department of Zoology and Entomology, Ohio State University; H. A. Gossard, Entomologist, Experiment Station, and E. C. Cotton, Chief, Bureau of Horticulture.

The following reports and papers were presented: H. A. Gossard, Timely Notes; Herbert Osborn, Further Notes on Meadow Insects; W. C. Kraatz, A Study of *Scirtes tibialis* Guer.; W. M. Barrows, Grassland Spiders Stratification in Associations; Robert K. Fletcher, A few notes on the Miridae of Meadows and Pastures; D. C. Mote, Report on Anthelmintic Experiments; T. H. Parks, The Bioclimatic Law (Law of Altitude, Latitude and Longitude) as Applied to Hessian Fly Control in Ohio; Edna Mosher, Some Interesting Beetle Larvae; A. J. Basinger, Preliminary Studies in Ohio Tachinidae; C. H. Young, Notes on Tropisternus glaber (Herbst); R. C. Osburn, The Onion Fly, Eumerus strigatus, in Ohio; J. S. Hine, The University Entomological Collections; J. S. Houser, An Undeveloped Profession.

J. S. Houser, *Secretary*.

Entomological Books

Complete Set

Proceedings Entomological Society of Philadelphia, Vols. I–VI, and Transactions American Entomological Society, Vols. I–XL, with Supplementary Vol. XIV.

Price on application.

Catalogue No. 6

Just issued—142 pages—entirely devoted to Books on Insects.

Sent on application.

Leng's List

Send in your subscription for Leng's List of North American Coleoptera.

Price $5.50 unbound, including delivery.
Printed on one side only $7.00.

JOHN D. SHERMAN, Jr.

24 CLAREMONT AVENUE

Mount Vernon, New York

NEW ARRIVALS

From Columbia, So. America:

OVER 10,000 BUTTERFLIES, INCLUDING

Morpho cypris
" sulkowskyi
Morpho amathonte
Caligo spp.

From Cuba:

1500 BUTTERFLIES AND MOTHS, INCLUDING

Papilio columbus
" andraemon
" celadon
" devilliersi
Urania boisduvali
Erinyis guttalaris
Protoparce brontes, etc.

From Venezuela:

Over 5000 Lepidoptera
200 Dynastes hercules

From New Guinea:

2000 Coleoptera
200 Orthoptera

From Assam, India:

1200 BUTTERFLIES AND MOTHS, INCLUDING

Papilio arcturus
" philoxenus
Kallima inachis
Brahmaea wallachi

And Many Other Showy Species

From Tibet (Bhutan)

Armandia lidderdalii
Parnassius hardwicki

CATALOGUES OF ENTOMOLOGICAL SUPPLIES AND SPECIMENS ON APPLICATION

If interested kindly send your list of desiderata for further information to

THE KNY-SCHEERER CORPORATION

Department of Natural Science
G. Lagai, Ph.D.

New York
404-410 W. 27th Street

MAY, 1919.

ENTOMOLOGICAL NEWS

Vol. XXX. No. 5

Thaddeus William Harris
1795-1856.

Smithsonian Institution
MAY 3 1919
National Museum

PHILIP P. CALVERT, Ph.D., Editor.
E. T. CRESSON, Jr., Associate Editor.

HENRY SKINNER, M.D., Sc.D., Editor Emeritus.

ADVISORY COMMITTEE:

EZRA T. CRESSON, PHILIP LAURENT, GEORGE M. GREENE, J. A. G. REHN, H. W. WENZEL.

PHILADELPHIA:
THE ACADEMY OF NATURAL SCIENCES,
LOGAN SQUARE.

Entered at the Philadelphia Post-Office as Second-Class Matter.
Acceptance for mailing at the special rate of postage provided in Section 1103,
Act of October 3, 1917, authorized on July 19, 1918.

ENTOMOLOGICAL NEWS

published monthly, **excepting August and September**, in charge of the Entomological Section of The Academy of Natural Sciences, Philadelphia, and The American Entomological Society.

ANNUAL SUBSCRIPTION, $2.00 IN ADVANCE.

SINGLE COPIES 24 CENTS.

ADVERTISING RATES: Full width of page. Payments in advance.

One issue, one inch,	$ 1.20,	two inches,	$ 2.40,	half page,	$ 4.00,	full page,	$ 8.00
Five issues,	" 5.50,	"	11.00,	"	17.50,	"	35.00
Ten issues	" 11.00,	"	20.00,	"	35.00,	"	70.00

☞ All remittances, and communications regarding subscriptions, non-receipt of the NEWS or of reprints, and requests for sample copies, should be addressed to ENTOMOLOGICAL NEWS, 1900 Race Street, Philadelphia, Pa. *All Checks and Money Orders to be made payable to the* ENTOMOLOGICAL NEWS.

☞ All complaints regarding non-receipt of issues of the NEWS should be presented within three months from date of mailing of the issue. After that time the numbers will be furnished only at the regular rate for single copies.

☞ Not more than two issues will be replaced gratis through loss, in transit or in change of address, unless such have been registered, at the subscriber's expense.

☞ Address all other communications to the editor, Dr. P. P. Calvert, Zoological Laboratory, University of Pennsylvania, Philadelphia, Pa., from September 15th to June 15th, or at the Academy of Natural Sciences, from June 15th to September 15th.

TO CONTRIBUTORS.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" for each number into the hands of the printer five weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form and without covers, will be given free, when they are wanted; if more than twenty-five copies are desired, this should be stated on the MS. The receipt of all papers will be acknowledged. Proof will be sent to authors for correction only when specially requested.

SPECIAL NOTICE TO AUTHORS

Owing to increased cost of labor and materials, no illustrations will be published in the NEWS during 1919, except where authors furnish the necessary blocks, or pay in advance the cost of making blocks, and pay for the cost of printing plates. Information as to the cost will be furnished in each case on application to the Editor. Blocks furnished or paid for by authors will, of course, be returned to authors, after publication, if desired.

☞ The printer of the NEWS will furnish reprints of articles over and above the twenty-five given free at the following rates: Each printed page or fraction thereof, twenty-five copies, 15 cents; each half tone plate, twenty-five copies, 20 cents; each plate of line cuts, twenty-five copies, 15 cents; greater numbers of copies will be at the corresponding multiples of these rates.

500 PIN-LABELS, 25 CENTS! All Alike on a Strip.

Smallest Type. Pure White Ledger Paper. Not Over 4 Lines or 30 Characters (13 to a Line). Additional characters 1c. each, per Line, per 500, Trimmed.

C. V. BLACKBURN, 12 Pine St., STONEHAM, MASS., U. S. A.

FREDERIC DuCANE GODMAN.

MAY 3 1919
National Museum

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

THE ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XXX. MAY, 1919. No. 5.

CONTENTS:

Obituary—F. D. Godman..... 121
Weiss and Nicolay—Notes on Zeugophora scutellaris Suffr., a European Poplar Leaf-miner, in N. J. (Col.). 124
Braun—Descriptions of New Species of Coleophora (Micro-lepidoptera)... 127
Marchand—Collecting the Larvae of Tabanus and Chrysops (Dip.) 131
Aldrich—Leiomyza in North America (Dipt., Drosophilidae)..... .. 137
Gage—The Staining of Coccids (Hom.) 142
Editorial—Entomologia Resurgens Belgica 144
Wellhouse—An Itonid Feeding on Rust Spores (Itonididae, Diptera) 144
Entomological Literature 145
Review—Comstock's The Wings of Insects..... 148
Doings of Societies—American Entomological Society..... 150
Feldman Collecting Social (Coleop.) 150

Frederic DuCane Godman.

(Portrait, Plate VI.)

Dr. F. D. Godman, a founder and editor of the *Biologia Centrali-Americana* and a writer on butterflies, birds and other subjects in natural history, died February 19, 1919.

Two autobiographical notices of Dr. Godman have been published. One is in the second volume of the Jubilee Supplement of *The Ibis* for March, 1909; it is in the third person, either having been written by himself or compiled from notes furnished by him. The other, in the first person, is in the Introduction to the Introductory Volume of the *Biologia*, London, 1915. From them the present account is derived.

Frederick DuCane Godman, third son of Joseph Godman, of Park Hatch, Surrey, was born on January 15, 1834. He attended Eton College and Trinity College, Cambridge, but

before going to Cambridge he made a tour to Constantinople, the Black Sea and Greece, during which, deliberately emulating Leander, he swam the Hellespont to the Asiatic side.

It was in October, 1853, that he went to Cambridge, where, already interested in natural history, he soon became acquainted with Osbert Salvin and the brothers Newton, and together they made many ornithological and lepidopterological expeditions in the neighborhood.

In August, 1861, he and Salvin went to Jamaica, Belize and Guatemala, collecting birds, insects, plants and fishes. A trip to the Azores, in 1864, yielded a book (*The Azores,* 1870) on the natural history results of the expedition. In 1872 he visited the Canaries and Madeira to compare their faunas more critically with that of the Azores.

In 1878, he and Salvin matured their plans for publishing some connected record of their natural history experiences in Central America, the now well known *Biologia Centrali-Americana,* the first part of which appeared in September, 1879, and the last, the Introductory Volume, in 1915. In the summer of 1879 they, in conjunction with H. J. Elwes and W. A. Forbes, collected Alpine butterflies in the Dauphiné Alps. In 1886, he and Elwes collected plants, birds and butterflies in many parts of India and in Ceylon..

In 1887, he was recommended by his doctor to spend the winter in a warmer climate and so went by way of New York to Central and Southern Mexico, collecting material for the great work. He was accompanied by Mr. and Mrs. H. H. Smith, "who proved marvellously good collectors in various branches of entomology."

He was not only a collector himself, but also purchased many insects brought together by others, such as Lidderdale's North Indian, Bates' Amazonian and H. Druce's butterflies; Sallé's, Boucard's, Forrer's and Höge's Mexican and Central American Coleoptera, F. Bates' Heteromera, part of J. S. Baly's Phytophaga, Janson's Elateridae, and miscellaneous collections by Becker, Biolley, Blancaneaux, Conradt, Gaumer, Janson, Lankester, Morrison, Rhoads, Staudinger, Underwood, Van Patten, Wittkugel and others. Among those whom

he and Salvin employed for the collecting of insects and other specimens for the *Biologia* were G. C. Champion, H. Rogers, E. Arcé, W. B. Richardson, F. B. Armstrong, W. Lloyd and M. Trujillo.

All of these collections were subsequently presented to the British Museum of Natural History, of which Dr. Godman became a trustee. Some indication of their extent has been given in the NEWS for May, 1916, page 196.

From very early days Godman exhibited an intense love of sport—hunting, fishing, shooting and stalking; he often followed the hounds. He keenly enjoyed horticulture and he collected ceramic ware.

Oxford made him a D.C.L.; he was a fellow of the Royal Society, President of the Entomological Society of London (1891-2), and of the British Ornithologists' Union, etc.

His great contribution to biology is the series of volumes forming the *Biologia Centrali-Americana*, accounts of which have been given in the NEWS for December, 1905, and May, 1916, and we have expressed our appreciation thereof editorially in the latter number. It is not superfluous to recall here and now that, in conjunction with Salvin and others, he wrote the volumes on Lepidoptera Rhopalocera and on Birds, as well as a large part of the Introductory Volume; in the treatment of the Hesperidae he made much use of characters drawn from the male genitalia.

The most recent letter which the writer received from Dr. Godman is dated December 4, 1915, and reads, in part:

> Very many thanks for your kind letter of congratulations on the completion of the "Biologia." Of course, after so many years, I am glad to see it finished. Had it not been for the kind assistance I have had from the large number of contributors, nearly all of which has been gratuitous, it could not have been done.

As one of those contributors, with the recollections of nearly ten years of my early manhood largely devoted to a small part of the *Biologia*, I feel with the passing of Dr. Godman—whom, alas, I never met personally—as if a certain portion of my own life also had passed away.

PHILIP P. CALVERT

Notes on Zeugophora scutellaris Suffr., a European Poplar Leaf-miner, in New Jersey (Col.).

By Harry B. Weiss and Alan S. Nicolay, New Brunswick, N. J.

This Chrysomelid, not heretofore recorded from New Jersey, was first observed in the State by Mr. Nicolay in a nursery at Arlington on June 23, where it was feeding on the foliage of poplar (*Populus deltoides*). It is a European species occurring in Middle Europe and also appears to be widely distributed in the United States. A specimen in the Schaeffer collection is labelled "New Mexico"; Mr. C. A. Frost writes that he has a specimen from Champaign, Illinois, and Blatchley in his "Coleoptera of Indiana" records it as rare in Starke and Wells counties. He further states that it was beaten from the leaves of hickory. In New Jersey we have found it only on poplar. Smith, in his list of the insects of New Jersey (N. J. State Mus. Report, 1909), mentions a related species, *Z. varians* Crotch, as being rare on poplar, and Blatchley also records this latter species from Indiana under similar conditions.

In New Jersey *Zeugophora scutellaris* is a feeder on poplar during its adult stage, and a leaf miner during its larval stages. It was very plentiful during the last week of June. The adults were active in the sunshine and when disturbed some would drop for six or eight inches, then recover and fly off. Many were observed in copula. The terminal leaves were preferred for feeding purposes and everything appeared to be eaten except the upper leaf surface and the supporting veins, even the smallest veins being left. The leaves were therefore skeletonized from the lower surface. Later, the upper leaf tissue and the veins dry and break, leaving irregular holes.

Eggs are deposited on the leaves and the larvae mine the tissue during July. By the first week in August many are full grown. They then leave the mines and drop to the ground in which pupation takes place, the adults appearing the early part of the next summer.

During the middle of September it was possible to find the yellowish, curved larvae from one to five inches below the

surface of the soil, most of them being at a depth of only one or one and one-half inches. Many of these larvae had been in the soil over one month and showed no signs of pupating. From this it seems likely that pupation takes place during the spring.

The larval mines are blackish, irregular and blotch-like,

Poplar leaves showing larval mines and adult feeding of *Zeugophora scutellaris*.

many of them extending over an entire leaf surface. They show more plainly on the upper surface, and as a rule only faintly on the lower. Usually a mine contained one larva, but in

a few cases two, and as many as four were found. The combined feeding and mining produces an injury which results in killing the foliage completely, most of it drying and falling to the ground. At Arlington the infestation was so severe that practically every leaf on four or five medium sized trees was infested.

Egg from dissected female. Length 0.6 mm. Greatest width 0.2 mm. Yellowish, oval, with broadly rounded extremities, one end slightly wider than the other, chorion smooth. Females collected on July 1 and dissected were found to contain from eight to thirteen well developed eggs and others in the process of development.

Full grown larva. Length 4-5.5 mm. Width, including tubercles, 1.7 mm. Color yellowish white, becoming yellowish when full grown, head and mouth parts dark. Body somewhat depressed, composed of 13 segments, apodous, anal end subtruncate. Sides of thorax and abdomen subparallel. Head with projecting mouth parts subtriangular, bearing median, dorsal dark line and several hairs. First thoracic segment flat, twice as long as second; second and third of equal length; first thoracic segment with faint, dorsal, transverse, foveiform impression. remaining thoracic and all abdominal segments except the last with transverse, undulating, impressed line on dorsal surface; lateral margin of first thoracic segment bearing two hairs; lateral dorsal portions second and third thoracic segments and each abdominal segment bearing two hairs arranged transversely. Abdominal segments subequal in length; sides of abdominal segments 1 to 8 produced into triangular tubercles, each bearing a hair. Ventral surface somewhat similar to dorsal, except that the lateral portions of the thoracic and abdominal segments bear only one hair. All hairs comparatively long, with somewhat tuberculate bases.

Adult. This was described by Suffrian in his paper "Fragmente zur genauern Kenntniss deutscher Käfer" (Entomologische Zeitung, zu Stettin, 1840), who gives *Populus nigra* as the food plant and the localities Aschersleben, Magdeburg and near Leipzig. The following description is from the original and from Blatchley's re-description:

"Elongate-oblong, convex. Black, except for the head, thorax, legs, pro- and mesosterna and the first three antennal joints which are clear yellow. Scutellum brownish. Thorax longer than wide, strongly convex, sides extended into prominent tubercles, surface coarsely punctate. Antennae stout, less than half the length of the body. Length 3.5-4.5 mm."

It is evident that the life history and habits of *Zeugophora scutellaris* are similar to those of *Z. flavicollis*. Kaltenbach, writing about this latter species in Pflanzenfeinde, 1874, p. 544, states that it occurs in Sweden and Germany on poplar, that the adults feed on the lower leaf surfaces and that the larvae are miners in the leaves of *Populus nigra*, the mines consisting of black spots on the upper surfaces. The larvae are legless, yellow with brown heads and flattened serrate bodies. Pupation takes place in the soil, the adults appearing in May of the following year.

We are indebted to Mr. C. W. Leng for supplying us with references to the foreign literature and to Mr. A. J. Mutchler, who, through the courtesy of Dr. F. E. Lutz, showed us this literature in the American Museum of Natural History.

Descriptions of New Species of Coleophora (Microlepidoptera).

By ANNETTE F. BRAUN, Cincinnati, Ohio.

(Continued from page 112.)

Coleophora polemoniella n. sp.

Head brown, palpi white, with a minute projecting tuft on the second segment, and marked with a brown streak along the outer side of the second and lower side of the third segment. Antennae with the basal, and three or four succeeding segments slightly thickened with scales; stalk whitish, annulate with brown. Thorax brown.

Fore wings golden brown, a distinct, rather broad white streak along the costa, fading out beyond the middle of the costa; a white streak along the fold nearly to the margin and broadest near the base; a white streak from the middle of the cell to its lower angle, broadest outwardly. Costal veins and one or two veins beneath the apex indistinctly marked with white. The spaces between these veins are shaded with dark brown, deepest toward the margins, but not extending into the cilia; the ground color above the discal streak is sometimes deepened. The conspicuousness of the white streaks varies; in some specimens all except the costal streak and the streak in the fold are almost indistinguishable. Cilia brownish, somewhat hoary along the costa. Hind wings dark grayish brown. Legs whitish, with a brown line along the outer sides. Expanse: 13-14 mm.

Locality: Cincinnati, Ohio, and vicinity. *Type* (a specimen showing all the marks described above) and paratypes in

writer's collection; paratypes in the Academy of Natural Sciences of Philadelphia and in the United States National Museum.

The larvae feed on the lower side of leaves of Greek valerian (*Polemonium reptans* L.), where they mine out the entire parenchyma, leaving silvery white patches. The mature case, of almost pure white silk, except where the overwintering grayer case marks its dorsal surface from mouth to one-half its length, is cylindrical, 9 to 10 mm. long with scarcely reflexed mouth, and with flattened, broadly expanded two-valved apex which is one and one-half times as broad as the maximum breadth of the case elsewhere. The apex is slightly asymmetrical, rather fish-tailed in shape. The mature cases were first observed April 16 and 18, and the larvae continued to feed for several weeks, pupating later on sticks and dead leaves near the food plants, where they are conspicuous because of their white color. Forty-two moths emerged from May 11 to June 2.

Mined leaves were collected June 13. The larva is yellow and makes a very fine whitish transparent thread-like mine, much contorted, which at last encloses in outline a slightly flattened ellipse,—that portion of the leaf which is to be cut out to form the first case. The portion cut out measures 2 mm. by 1 mm. This piece, in which the parenchyma is not consumed, forms the foundation for the case. It is folded, seam on under side and closely sewed together; it extends to the mouth of the case, but toward the apex, the case is made entirely of pale greenish silk, this silken portion projecting about half a millimeter beyond and of a slightly less diameter than the leaf part, and lacking the expanded apex of the mature case. Feeding ceases about July 1, when the case is about 4 mm. long, and is not resumed until early the following spring.

Coleophora ericoides n. sp.

Head grayish white; second segment of palpi fuscous outwardly, with a minute projecting tuft; third segment white, fuscous beneath. Antennae simple, whitish fuscous, indistinctly annulate beneath only.

Thorax and fore wings pale grayish ocherous. A rather distinct white streak along the costal edge to beyond the middle, where it blends

with the whitish costal cilia. White streaks usually indistinct and interrupted mark the course of the veins; of these the most distinguishable are along veins 11 and 10 and along the upper margin of the cell. A faint narrow line runs for half the wing length above the fold and parallel to it; another short line lies just below and alongside of the fold. A short streak sometimes runs through the outer half of the cell. The dorsal margin is narrowly white. Dorsal cilia concolorous with the wing. Hind wings grayish ocherous. Legs whitish, with the outer surfaces marked with brown. Expanse: 12 mm.

Locality: Cincinnati, Ohio. *Type* and six paratypes in writer's collection.

The larva mines the seeds and receptacle of a wild white aster (*Aster ericoides* L.). Numbers of the small seeds of the flower heads may be found eaten out presumably by the larva before making a case, or while the case is still very small. Later the mature case is attached to the surface of the receptacle and the larva mines into it, eating out the pithy central portion; one or two circular holes mark the point of entrance. The mature case is short, cylindrical, with three-valved apex, measuring 4.5 to 5 mm. in length, with a greatest diameter of 1.3 mm. The case is spun entirely of silk, in color varying from pale straw to brownish cinereous; it is more or less densely covered with pappus from the flowers, attached irregularly over the surface and extending backwards beyond the apex. It is thus difficult to discern in the ripening seed-head. The larvae are fully fed in the latter part of November and early in December may be found crawling or attached to stems and sticks in the neighborhood. The moths emerged September 17 to 28.

Coleophora amaranthella n. sp.

Head pale dull ocherous, palpi whitish, apex and projecting tuft of second segment fuscous. Antennae whitish, annulate indistinctly with brownish ocherous. Thorax whitish dull ocherous.

Fore wings pale brownish ocherous, the spaces between the veins reaching the costal edge white, more or less densely dusted with fuscous; beneath the apex the ground color is irregularly sprinkled with white and fuscous scales. A white dusted streak extends through the cell, starting faintly near the base and broadening outwardly and ends at the lower angle of the cell in a rather conspicuous fuscous spot. A dusted white streak along the fold and another along the dorsal margin. Hind wings pale grayish ocherous. Legs whitish with a fuscous

line along the outer surfaces; tarsi fuscous. Abdomen whitish beneath, grayish ocherous above. Expanse: 13 to 14 mm.

Locality: Cincinnati, Ohio (probably widely distributed with its food plant.) *Type* and paratypes in writer's collection; paratypes in Academy of Natural Sciences of Philadelphia and in the United States National Museum.

Twenty-eight specimens reared from larvae eating out the seeds of pigweed (*Amaranthus hybridus* L.). Mature case 6 mm. long, subcylindrical, with mouth slightly bent over, thickest just behind the middle whence it tapers slightly before flaring to form the three-valved apex. It is spun entirely of rough brownish silk decorated with numerous irregular, small, buffish gray particles. The larvae feed throughout the autumn and remain during the winter hidden among the old flower clusters. Imagos emerged from July 27 to August 23.

The fuscous spot near the lower angle of the cell is the distinguishing characteristic of this species.

Coleophora granifera n. sp.

Head whitish, ocherous above; palpi dark fuscous on the outer sides; antennae whitish, with the basal segment enlarged with scales near the extreme base. Thorax whitish ocherous.

Fore wings with the white color predominating, so that the ground color may be regarded as white with ocherous streaks. Costal edge, for one-third its length ocherous, extreme costa near the base fuscous. There is sometimes a very small ocherous streak near the costa, just proximal to vein 11; ocherous streaks lie in the spaces between the remaining costal veins, and the apex of the wing is ocherous. An ocherous streak extends from near the base through the upper half of the cell and runs into the apex. There is sometimes an ocherous streak through the lower half of the cell, running into the ocherous outer margin of the wing. This may be as distinct as the other discal streak or entirely wanting except near the outer margin. An ocherous streak from the base below the fold usually reaches the wing margin. There is sometimes faint fuscous dusting, especially in the apex and along the costal ocherous streaks. Cilia ocherous and white intermixed. Hind wings pale grayish ocherous to fuscous, usually darker than the fore wings. Legs whitish, fuscous outwardly. Abdomen whitish beneath, fuscous in the mid-dorsal line. Expanse: 12.5-14 mm.

Locality: Cincinnati, Ohio. Type and paratypes in writer's collection.

The cases are found on the under side of leaves of *Aster shortii* Lindl. The nearly full-grown larvae with mature cases feed on the lower leaves near the ground in early spring. The mature case is about 10 mm. long, cylindrical, with mouth slightly deflexed and with two-valved slightly expanded apex. It is spun of brownish red silk, paler toward apex, with a dark brown granular spot on the upper side beneath the mouth. The larvae continue to feed until the middle of May, and produce moths from June 2 to July 10. Eleven specimens reared; two captured.

Leaves mined by the larva before constructing its first case, were collected in the latter part of June. This mine is irregular, sometimes trapezoidal in shape, and is several times the area of the first few mines made after the larva spins its minute case, which is covered closely toward apex with the black frass taken from the mine. These mines extend in a curve across the leaf, gradually increasing in size. The case is gradually elongated at apex and mouth and increased in diameter by the splitting open and filling in of the under surface with silk. These additions are pale gray at first, later becoming reddish, and the original frass-covered case forms the dark brown patch on the upper side of the mature case. During late summer and fall, the larvae mine the small leaves up amongst the inflorescence.

The imagos of this species, particularly the paler specimens, are only with difficulty distinguished from those of *C. vernoniaecella* Chambers, in which the position and course of the markings are practically the same. The latter species is larger and paler, with the outer margin mostly white, instead of ocherous.

Collecting the Larvae of Tabanus and Chrysops (Dip.).

By WERNER MARCHAND.

(From the Department of Animal Pathology of The Rockefeller Institute for Medical Research, Princeton, New Jersey.)

While the larvae of mosquitoes and many other Diptera Nematocera are comparatively well known, as they are aquatic in habitat, and while the larvae of many Brachycera have been

frequently reared from all sorts of decaying material, the mud-inhabiting larvae of the Tabanidae have received but scanty attention from entomologists. Yet the Tabanidae constitute a family of wide distribution, rich in species and abundant in individuals. They are therefore entirely worthy of the attention of the scientific dipterist. Moreover, the Tabanidae represent a considerable source of trouble to cattle and live stock, being so numerous in some localities as to be seriously disturbing.

The large black horseflies have been noticed by most of us. The "greenheaded" flies are a serious and well-known pest, especially in the region of the shore. In certain regions in the South Tabanidae are so numerous that they are especially mentioned by travelers, and particular regions have their particular flies. Some species, for instance those of *Chrysops* and *Diachlorus* ("the yellow fly of the Dismal Swamp") will attack man freely and inflict painful bites. These flies are also very common in New Jersey, sixty-five species having been listed.

The reason why apparently the larval stages of these flies have been very generally overlooked lies in the fact that they inhabit the wet soil in the immediate neighborhood of water. In other words, they are not taken by the ordinary collecting methods of the fresh-water-exploring entomologist, since, for the purpose of taking water insects, usually a net is employed, and the taking of much mud into the net is carefully avoided. The Tabanid larvae are never, or only in very young stages, found submerged under water, hence they are never taken with the fishing net.[1] On the other hand, the land-collector will

[1] This statement apparently has to be modified. That Tabanid larvae may be found occasionally submerged, at least in the fall, possibly in preparation for passing the winter, is a fact which I owe to Dr. Robert J. Leavitt in Trenton who, in October, 1918, took three half-sized larvae of *T. atratus* in mud (or water), while dredging with a net for tadpoles and sunfish in water eight or ten inches deep, over mud in which grows a characteristic mud vegetation. The locality was a pond on a dairy farm near Trenton Junction. The three larvae were taken in

examine vegetation, bark and stumps of trees, heaps of dead leaves, or whatever is found underneath stones; he will occasionally proceed to sifting, but in this case, of dry material. He will not examine, as a rule, the wet soil adjoining water; therefore he will take Tabanid larvae only occasionally.

These larvae are, however, almost invariably present in the soil immediately above water, at the edge of brooks, ponds, lakes and streams, small springs and water holes; in short, almost any kind of permanent body of water. They may be

three different dips of the net and always at two or three feet distance from shore. There was no possibility that they came from anywhere but in or under the water.

Tabanid larvae of various species have been taken by myself in the mud of the edge, not submerged, in the months of September, October, November and February when the weather was mild, but it is possible that they are able to pass the cold periods of the winter below the water since, according to my experience, they apparently do not stand much freezing; on the other hand, their need of oxygen is not as great in winter as in summer. That the very young stages of many species (*Chrysops*) undoubtedly live submerged, has already been stated; those stages may derive oxygen from submerged plants (algae, etc.).

I notice that H. H. King (Report Wellcome Tropical Research Laboratory, Bulletin of Entomological Research, Vol. 1, Part 4, December, 1910, page 265.) has stated of the larvae of the African *T. ditaeniatus*, that they were found submerged in a small water channel, the water of which was overgrown with a covering of green slime and if this was cleared away, a few larvae could generally be seen at the surface. "On stirring the mud at the bottom and edges of the water," says King, "more would appear, while if one waited for an hour or so, specimens would continue to rise. They were apparently living at the bottom of the pools and coming periodically to the surface to breathe. They could be seen rising to the surface by a lashing motion, and if left undisturbed would, after a few seconds, sink out of sight again."

Certain species of Tabanidae live, as larvae, under stones in shallow, rapid-flowing water, notably *T. kingi* (King) and *T. vivax* (Hine). The latter species may be taken if a sieve is held so that as a stone is being lifted, the larvae under it are swept into the sieve by the current (Hine).

These exceptional cases should be taken into consideration by collectors, but, on the whole, the rule holds good that Tabanid larvae are found in the soil and mud immediately above water and near the edge, as hundreds of captures have demonstrated.

most easily obtained by means of a wire kitchen strainer six inches in diameter and of medium size mesh, with strong handle. These strainers are used in households and can be furnished by any hardware store. In sifting for the larvae, a lump of mud the size of a fist or larger is taken from the edge of the water and placed into the strainer. The latter is then gently shaken, at the same time immersing it in the water near the edge. The earthy constituents are washed through the wire meshes and the Tabanid larvae become visible. This process is repeated until it gives positive results, which is nearly always the case within less than half an hour. If the larvae are not found readily in one place, they will often be present in another place only a few feet distant. It is often found convenient to seize bundles of sod by the roots and shake them with water in the strainer until the earth is washed off. Frequently the larvae are found clinging to the grass roots. Wherever soft mud is exposed to the surface directly adjoining the water, it should be put through the strainer and it will usually contain some larvae. Even sandy and muddy banks without any vegetation will frequently yield an abundance of larvae of *Tabanus* and *Chrysops*. At ponds where a rich green vegetation of *Lemna* and aquatic weeds is present, the half-decaying masses which border the edge of the mud underneath may contain larvae. Brooks with coarse sand or gravel are not favorable because the coarse sand does not pass through the meshes of the strainer and therefore the larvae are often overlooked or injured. Generally, the larvae are located only a few inches from the surface, but may be found to a depth of one foot, and in some localities even deeper. In places where the water has receded, owing to dry weather, the larvae will often follow the receding water and be found at the new edge, but if the ground retains some moisture they may be looked for all over the formerly inundated region. Ponds or brooks with a definite permanent border give better results than indefinitely bordered swamps, wet meadows, etc. One has always to bear in mind that the larvae are air-breathers and as such may scatter in swampy regions with low water level over wide areas, while in all localities where the water maintains a certain level,

they are forced to aggregate at the borders. On the other hand, being dependent on moisture, they do not usually go any great distance away from these borders.

It is not difficult for the entomologist to identify the Tabanid larvae as such. The larvae are nearly always cylindrical in shape, whitish, grayish or yellow in color, and characteristically hard and firm to the touch. This is due to their strong chitinization and their contraction at the moment when they are taken. They generally will soon begin creeping and then will appear more slender and more pointed at the cephalic end. The small larvae of *Chrysops* are usually taken when between 5 and 10 millimeters long; the smaller ones escape attention. The *Chrysops* larvae are whitish or greenish yellow, the end of the abdomen often darker. The *Tabanus* larvae are found in all sizes from 5 to 45 millimeters, more frequently, however, of the medium size. They are usually whitish, yellowish or reddish grey, either without pattern and shiny, or with gray or brown transverse markings. In all larvae the proleg-bearing ridges may be quite conspicuous. The larvae of most species do not float at the surface but sink to the bottom of the water; certain species as, for instance, *T. lineola* and *T. atratus*, have inflated tracheae and float at the surface when washed out of their habitat. This facilitates their capture, and in places where these larvae alone occur, a strainer is not necessary. All that is needed is to throw lumps of mud and sod, grass, bushes, etc., from the edge into the water, stir them and work them over for a while and the larvae will soon rise to the surface where they betray their presence through vigorous wriggling or lashing movements.

Together with the Tabanid larvae, one may obtain, by means of the strainer, the larvae of other Dipterous families, chiefly Dolichopodidae, Leptidae and Tipulidae. The former two families comprise larvae usually of the size of *Chrysops* larvae but more slender, shiny white or yellowish, the end of the body not pointed or rounded but truncated or ending in several lobes. The Tipulid larvae, when belonging to larger species, are generally gray or blackish in color; those belonging to

smaller species may be yellow, white or greenish. All Tipulid larvae are distinguished from Tabanid larvae by being quite soft to the touch, with no well-marked circular annuli.[2]

Tabanid larvae can be taken at all times of the year; certain species seem to have a preference for definite localities where they are regularly present while other equally common species are absent, having their breeding-places elsewhere. It is therefore possible to obtain breeding material of definite species at all seasons provided a good breeding locality has been found. But some species are found pretty nearly everywhere. Late fall, winter and early spring are favorable seasons for collecting, as the presence of vegetation is not as interfering as in summer.

When collected, the larvae should be placed with wet plant material, and then should be isolated as soon as possible, as they will proceed to eat one another in a very short time. Each larva ought to be placed into a glass vial. The writer uses test-tubes with lip, and lined with filter paper, but small, so-called homoeopathic vials answer the purpose perfectly well. For moisture, a lump of plant material, or wet filter paper, blotting paper and the like should be placed in the bottle. The neck should be covered with cheesecloth or linen. Instead of string, rubber bands may be very conveniently used. If the bottles have no neck or lip the larvae will frequently escape, as they are able to force their way through almost any passage. As food, small earthworms, or pieces of such, or small pieces of raw meat, can be given,[3] but the larvae can do without food for a long time if kept moist, since they are very hardy. In this condition the larvae are ready for mailing; a number of such bottles or vials, with locality labels attached to them, can be packed in cotton and shipped any distance.

It is to be hoped that collectors stationed in localities where

[2] The larger Tipulid larvae are found more abundantly among decaying leaves, grass roots, etc., in the edge of the water than in the mud itself.

[3] I notice that larvae of *T. atratus* take boiled as well as raw meat. If boiled meat is given, care should be taken that it is not salted, as in this case the larvae would probably not accept it.

Tabanidae are numerous and where species occur, the larvae of which are not known at all, will utilize their opportunity for the sake of entomological science, and kindly send such material to the specialist. The systematic study of the larvae of Tabanidae is not only of direct interest for the classification of the flies of this family, but is also of great importance for our understanding of Dipterous larvae in general and of their phylogeny.

A few words might be added with reference to the pupae. The Tabanid larvae pupate in their normal habitat, in wet soil, near the surface, and the pupae are not infrequently found in the strainer, though, owing to the shortness of the pupal period as compared with the larval stages, they are not nearly so commonly found as the larvae. The small pupae of *Chrysops* are about 10 mm. long and brownish or grayish yellow in color. The *Tabanus* pupae may be much larger, and of grayish, greenish or fuscous coloration. The pupae of both genera look much like Lepidopterous pupae, having, however, the abdominal segments bordered with narrow fringes of spiny bristles; by means of these fringes the pupae work their way to the surface when the water rises, and when the fly is about to hatch. If placed on moist, but not too wet, ground the pupae will usually hatch within less than two weeks. The pupal shells should be carefully preserved together with the fly which emerged from them. If the larval skin is still present, it should be placed in alcohol; the exuvia is often all that is necessary for a description of the larva.

Leiomyza in North America (Dipt., Drosophilidae.)

By J. M. Aldrich, U. S. Department of Agriculture, Bureau of Entomology, Washington, D. C.

Historical.

Leiomyza was proposed by Macquart in 1835 for Meigen's *Agromyza glabricula* and *laevigata*, which, as Macquart observed, differed too much on the absence of vibrissae and of anterior frontal bristles to remain in *Agromyza;* he also men-

tions approximated crossveins and the forward curvature of the fourth vein as generic characters, but the former of these proved to be a mistake.

Meigen in 1838 accepted the genus and added a third species, *Heteroneura scatophagina* Fallen, which he had himself previously referred to *Agromyza*. He figures *glabricula*, but the venation is not quite alike in the two wings, and he shows a full complement of basal cells which afterward proved an error. He mentions as generic characters only the absence of bristles on the anterior part of the front and the course of the fourth vein.

Westwood in 1840 placed *Leiomyza* as a subgenus of *Agromyza*, defining it in a few words and repeating Macquart's error about the approximation of the crossveins; he mentioned *scatophagina* as "typical species," although he probably had no thought of giving it any taxonomic prominence above the other two by so doing. As it was not originally included, it could not be the type species in a modern sense.

Zetterstedt in 1848 gave the best description of the genus yet published, evidently drawing the characters from Fallen's type of *scatophagina*, which he also redescribed; he also designated this species as "*Typus generis.*"

Schiner in 1864 was unable to give a satisfactory account of the genus, his only material being a determined specimen from the Haliday collection and one from Winnertz, which were obviously not congeneric, yet both resembled the descriptions. We can now decide that Winnertz was right, but Schiner could only adapt the earlier descriptions after a fashion, leaving the genus more confused than before.

Rondani never attempted to place the genus.

Becker cleared up the matter very much in 1902 by publishing the characters of the specimen standing as type of *laevigata* in the Meigen collection, with a figure of the venation. This specimen has the characters assigned by Meigen to the genus, but specifically agrees better with *glabricula*, as it has yellow halteres and the hind femora not black at tip. The *glabricula* type, or supposed type, is preserved with it but is now headless. It has the same wing characters and is un-

doubtedly congeneric. Becker makes the genus out as a perfectly good one, differing from *Astcia* chiefly in having a hind crossvein and a longer (normal) second vein, and he places it in Drosophilidae next to that genus. From the material (North American) that I have seen, I entirely agree with this; we have a genus still more nearly related. *Sigalocssa*, which possesses a hind crossvein, hence differs hardly at all except in its greatly shortened second vein.

Czerny in 1903 gave some notes on a speciment of *scatophagina* in Zetterstedt's collection, including additional generic characters. This species is strictly congeneric with the other two, if not in fact an earlier name for *glabricula*. Meigen in the original description of *laevigata* suggested that it might be only a variant (Abänderung) of *glabricula*. As no valid designation of a genotype has been made, *glabricula* is hereby designated.

Williston in 1896 (a) reported the genus from North America and placed it in his table of Agromyzidae (1896b); but in 1908 he omitted it, evidently not satisfied with his identification.

Melander in 1913, in his exhaustive treatment of Agromyzidae and related families, mentions *Leiomyza* as a genus unknown to him.

Lorenz Oldenberg in 1914 gives generic characters from numerous specimens and from Becker and Czerny. He finds the flies in the forest in Germany on exuding sap of trees, on tree fungi, and on boards in the sun. His specimens show considerable variation in the amount of infuscation of the front, antennae and femora, but seem to agree with *laevigata*.

With this historical review, I proceed to a description of the genus and two new North American species.

Generic Characters.

Head nearly hemispherical, concave behind, the eye very large, bucca and parafacial extremely narrow. Antennae ordinary, inserted at about the middle of the head in profile, arista bare or slightly pubescent. Face short, not carinate; a minute pair of vibrissae present. Front and face of equal width, less than one-third that of head; front flat, smooth, or-

bits more or less differentiated above for a short distance, and shortly above antennae with a transverse depression. Two pairs of verticals, one of frontals, which are at the level of the median ocellus. Post-verticals absent (in ours, said to be divergent by Oldenberg).

Thorax and abdomen in all the species black and highly polished. Chaetotaxy of thorax: dc 1, npl 1, stpl 1, sc 1 (and a very minute lateral pair, apparently absent in the female of *slossonae*); acrostichals in the North American species a very delicate single row of hairs, laterad of which the surface is entirely bare to another row in the dc line. Wing as figured, second basal and anal cells wanting, fourth vein gently curved forward from near the crossvein, so that the first posterior cell is about two-thirds as wide at apex as near its base.

Table of North American Species.

Front and hind femora distinctly stouter than middle ones
slossonae n. sp.

Front and hind femora of about the same diameter as the middle ones
melanderi n. sp.

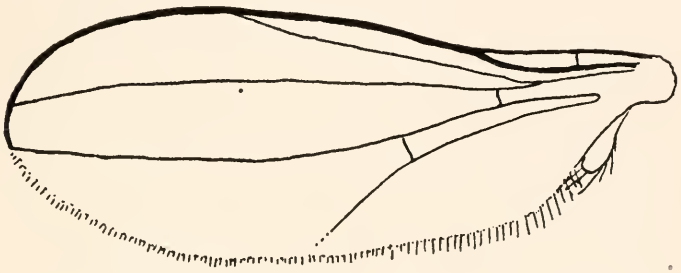
Leiomyza slossonae n. sp.

Front brown, including an extension to the vertex on each side of the ocelli; ocellar triangle and the upper third of frontal orbits shining black; lower edge of front yellow; antennae yellow, third joint, oval, slightly infuscated or not on upper edge; arista microscopically pubescent, appearing bare under hand lens. Face, parafacials and bucca almost white, sometimes more yellowish, with a narrow brown line usually perceptible separating the first two and bordering the sides of the mouth cavity. Palpi yellow; proboscis small, yellow. Halteres yellow. Legs including coxae wholly yellow except last tarsal joint, which is brown; front and hind femora thickened in both sexes, and their coxae and trochanters a little elongated. Length 1.8 mm.

Types, one male (holotype), one female, mounted on same pin, from Franconia, New Hampshire, collected by Mrs. Slosson and in her possession. *Paratypes*, one each from Pullman, Lyndon and Almota, Washington, and one from Moscow Mountain, Idaho, all collected by Professor Melander. Paratype from Washington deposited in the United States National Museum.

Leiomyza melanderi n. sp. (Text Fig. 1, wing).

Smaller than *slossonae* (1.5 mm.), all the femora slender; legs pale yellow, last tarsal joint almost black. Face not usually so whitish, more yellow. The specimen from Montreal has the head darker, front blackish-brown, with a faint median paler streak, lower edge pale



Text Fig. 1.—*Leiomyza melanderi* n. sp. Right wing, under side. × 46.

yellow, face and bucca quite dark yellow, third antennal joint about half infuscated. This I can only regard as a dark form of the same species, although the front looks different.

Types, one male, one female, Moscow Mountain, Idaho; *paratypes,* one each from Moscow Mountain, Idaho; Pullman, Olga, Everett and Almota, Washington; all the preceding collected by Professor Melander, in whose possession the types remain. Also one female paratype from Montreal, Canada, collected by Rev. Jos. Ouellet. Two paratypes from Washington in the United States National Museum.

LITERATURE CITED.

BECKER, 1902, Zeitsch. f. Hym. u. Dipt., ii, 340.
CZERNY, 1903, Wien. Ent. Zeit., xxii, 127.
MACQUART, 1835, Hist. Nat. Dipt., ii, 605.
MEIGEN, 1838, Syst. Beschr. eur. Zweifl. Ins., vi, 394.
MELANDER, 1913, Jour. N. Y. Ent. Soc., xx, 228.
OLDENBERG, 1914, Arch. f. naturgesch., 80 Jahrg., Abth. A. Heft 2. p. 36.
SCHINER, 1864, Fauna Austr., ii, 309.
WESTWOOD, 1840, Introd. Mod. Class., ii, app., 152.
WILLISTON, 1896a, Ent. News, vii, 394.
ID., 1896b, Manual of N. A. Dipt., sec. ed., 104.
ID., 1908, Manual, 3d ed.
ZETTERSTEDT, 1848, Dipt. Scand., vii, 2676.

The Staining of Coccids (Homop.).*

By J. Howard Gage.

Students of the Coccidae have long desired a stain that would permanently color the chitinous exoskeleton and at the same time give enough contrast to make the more minute details of structure plainly visible under the microscope. Until the present time such a stain has not been found. In most cases in specimens that have been stained the color disintegrates with age, leaving them muddy, and in fact, in a much worse condition for study than they would have been had no stain been used.

In my work with the Coccidae several of the more common stains were tried, one by one they were discarded until only säurefuchsin remained. This substance gave on the whole the best results, but even in specimens colored with this stain the color faded after a time. Säurefuchsin is, as the name implies, an acid stain having enough acid combined with the coloring properties of the substance to produce acidity, providing the specimen treated is neutral or acid. It is evident, then, that the presence of an alkali even in minute quantities will impair the working of the stain, for such an alkali would neutralize the acid of the stain and cause it to break down. To remove all traces of the potassium hydroxide ordinarily used in cleaning specimens requires more than the customary three or four baths of distilled water; in fact one can never, according to the theory of limits, remove all of the alkali simply by washing, even though one might reduce it to a negligible quantity. In order to prevent any alkali being present, a ten per cent. solution of hydrochloric acid was added to the staining solution. This excess of acid neutralized the small amount of potassium hydroxide that remained, precipitating it as a potassium salt, leaving an excess of hydrochloric acid in the staining solution and the specimen.

$$HCl \text{ (in excess)} + KOH = KCl + HOH + HCl.$$

The precipitated potassium chloride is very highly soluble in water, but since all of the water is removed during the dehydration of the specimen there remains nothing except a few crystals of potassium chloride and hydrochloric acid in excess. As there is an excess of acid in the specimen, it is clear that if it be mounted and sealed in with acid balsam it will

*Contributions from the Entomological Laboratories of the University of Illinois. No. 59.

remain an acid preparation and its color will not disintegrate.

A check series of experiments was carried out to determine the action of alkali on the stain. In this series the staining bath was made strongly alkaline by the addition of potassium hydroxide. The results of the experiments show, conclusively, that the presence of an alkali does cause the color of the stain to disintegrate. In fact, when the specimens were removed from the staining solution all of the color had faded from the bath itself and the specimens showed no color whatsoever.

Various strengths of staining solutions were tried in a careful and somewhat extended series of experiments. In this series species of coccids with a thin cuticle, those with a medium heavy cuticle, and those with a heavy cuticle were used. As a result of these experiments it was found that the following formula produced the best coloring in all of the species tried:

Säurefuchsin	0.5	gram
10 per cent. hydrochloric acid	25.0	cc.
Distilled water	300.0	cc.

The above formula is recommended as a solution of a stain that will produce a permanent and successful color in the Coccidae and their near relatives in thirty to forty minutes. It can be kept indefinitely in a glass-stoppered bottle and used whenever there is an occasion.

Specimens to be stained should be removed from the potassium hydroxide and thoroughly washed in three or four changes of distilled water, then placed in a Syracuse watch-glass containing a few cubic centimeters of the staining solution for twenty or forty minutes. After the staining is completed, they should be removed and treated in the manner usually followed in making preparations of coccids. Säurefuchsin is not highly soluble in either carbol-xylene, clove oil, or alcohol, therefore, the specimens may be left in solutions of these substances a sufficient length of time to insure complete clearing and dehydration.

The explanation of the so-called fading of color in stained coccids is that they are probably alkaline, and if the specimens are made acid, that is to have an excess of acid present, they will not become muddy or colorless. Specimens that were stained, using this formula, in the winter of 1915, are at the present time as brightly colored and show as much contrast as they did when freshly prepared, while specimens stained at the same time using a neutral solution, or one that did not contain an excess of acid, have become almost colorless.

ENTOMOLOGICAL NEWS.

PHILADELPHIA, PA., MAY, 1919.

Entomologia Resurgens Belgica.

The American Entomological Society has lately received in exchange Number 1 of the Nineteenth Year of the *Revue Mensuelle de la Société Entomologique Namuroise,* dated Namur (Belgium), Jan. 25, 1919. The opening paragraphs are as follows (translated):

After 53 months of silence, our review reappears; at first under a modest aspect that we will seek to improve in order to give it as rapidly as possible all its old vitality. We appeal for the aid of all our friends; during the long months of desolation, entomology has been a consolation and we count on an ample harvest of notes and interesting observations, continuing to give to our review that personal character which has made it so valuable. It does not enter into our plan to speak of the war; our beautiful patriotic song, "To The Future," ought to be our guide; it will inspire us and will show us our path; with the help of God we do not doubt of success. Our Society has decided to break off all relations with the German countries and their allies. The barbarism, of which we have been the victims, approved by their savants (?), has made this purification necessary. Andenne, Dinant, Tamines, Louvain, Rheims and how many other cities and villages are not scraps of paper which a Chancellor can ever make disappear.

Let us by a League of Nations, or by any other means, and by all means prevent a repetition of the horrors which have compelled our Belgian confrères to write these words.

An Itonid Feeding on Rust Spores (Itonididae, Diptera).

During the summer of 1918 some interesting itonid larvae were found living in hypertrophied fruits of *Crataegus* at Ithaca, New York. The adults, when bred from the fruit, were sent to Dr. Felt for identification. He found them to be *Mycodiplosis cerasifolia* Felt. This species was first reared September 4, 1907, from irregularly thickened folded choke cherry leaves taken at Newfoundland, New Jersey, and described by Dr. Felt in "New Species of Cecidomyiidae II," p. 21, 1907. A figure of the gall produced on choke cherry leaves is given in Thompson's Illustrated Catalog of American Insect Galls (plate 8, figure 327) and this is reproduced in New York State Museum Bulletin 200 (plate 11, figure 4) by Dr. Felt.

The infested fruits of *Crataegus* on examination were found to have a fungous disease called Crataegus rust or quince rust, *Gymnosporangium clavipes* C. and P. According to Weimer (Cornell University Bull. 390) this disease is widely distributed in the eastern and central

United States and is sometimes of considerable economic importance on the quince. It attacks fruit, leaf petioles, stems and thorns of *Crataegus,* causing rough enlargements from which the long finger-like aecia begin to break out the last of July or first of August. The peridium or spore sac which covers the aecium is white and is filled with a mass of orange-colored aeciospores.

These itonid larvae live among the aeciospores and feed upon them. Larvae collected August 1 were washed in alcohol to remove the spores adhering to their moist cuticula and examined under the microscope. The alimentary canal was found to be filled with the orange-colored spores, and these caused the larvae to appear orange. The larva is 1.85 mm. long and 0.35 mm. broad at the middle when full grown. It does not show the characteristic "breast bone" so commonly seen on the larvae of this family.

When infested fruit was placed on moist sand the larvae transformed to adults on the surface of the sand and when infested fruit was placed in a tin box with no earth or sand the larvae transformed on the bottom of the box. This seems to indicate that under natural conditions the larvae go to the surface of the ground to pupate. Larvae which were brought into the laboratory August 1 left the fruit within two days and emerged as adults August 12. Other larvae were found feeding on the spores in the field September 6 and October 1, so that there are probably several generations a year. The insects are not present in the hypertrophied fruits during the winter, so it seems probable that they hibernate as pupae on the ground.

The swellings due to this rust were found quite often at the bases of the thorns as well as on the fruit, and every one examined contained larvae. They were never found within the fruit or thorn itself, but always in the fungus. They were found on *Crataegus neofluvialis, C. punctata, C. macracantha, C. pruinosa* and *C. tomentosa.* The red cedar *Juniperus virginiana* is the alternate host of the rust and *Crataegus* trees near a red cedar are more liable to be infected than those farther from it.—WALTER H. WELLHOUSE, Dept. of Entomology, Cornell University, Ithaca, New York.

Entomological Literature.

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded.

The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of papers containing new genera or species occurring north of Mexico are all grouped at the end of each Order of which they treat.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

4—Canadian Entomologist, London, Canada. **5**—Psyche, Cambridge, Mass. **9**—The Entomologist, London. **10**—Proceedings of the Entomological Society of Washington, D. C. **11**—Annals and Magazine of Natural History, London. **15**—Insecutor Insci-

tiae Menstruus, Washington, D. C. **16**—The Lepidopterist, Salem, Mass. **17**—Lepidoptera, Boston, Mass. **18**—Ottawa Naturalist, Ottawa, Can. **24**—Annales de la Societe Entomologique de France, Paris. **25**—Bulletino della Societa Entomologica Italiana, Firenze. **28**—Entomologisk Tidskrift, Uppsala. **29**—Proceedings of the Linnean Society of New South Wales, Sydney. **52**—Zoologischer Anzeiger, Leipsic. **76**—Nature, London. **82**—The Ohio Journal of Science, Columbus. **89**—Zoologische Jahrbucher, Jena. **90**—The American Naturalist, Lancaster, Pa. **91**—The Scientific Monthly, Lancaster, Pa. **92**—Archives de Zoologie Experimentale et Generale, Paris. **93**—Bulletin, Division of the Natural History Survey, Urbana, Illinois.

GENERAL. **Bradley, J. C.**—An entomological cross-section of the U. S. **91,** viii, 356-77 (cont.). **Calvert, P. P.**—An appeal from Belgium. **4,** 1919, 62-3. **Crampton, G. C.**—Evolution of arthropods and their relatives with especial reference to insects. **90,** liii, 143-79. **Davis, J. J.**—Contributions to a knowledge of the natural enemies of Phyllophaga. **93,** xiii, 53-138. **Felt, E. P.**—Insect galls and gall insects. **18,** xxxii, 127-31. **Godman, F. D.**—Obituary notice. **9,** 1919, 71-2; **76,** ciii, 5-6. **Holmgren, N.**—Zur vergleichenden anatomie des gehirns . . . Arachniden . . . Myriapoden und Insekten. (Kung. Svenska Vet.-Akad. Handl. lvi, No. 1.). **Knab, F.**—Obituary by Caudell, Busck, Howard [with bibliography]. **10,** xxi, 41-52. **Tillyard, R. J.**—The panorpoid complex. A study of the phylogeny of the holometabolous insects with special reference to . . . Panorpoidea and Neuropteroidea. The wing coupling apparatus with special reference to the lepidoptera. Wing trichiation . . . **29,** xliii, 265-319; 626-57.

PHYSIOLOGY, GENETICS, ETC. **Nabours, R. K.**—Parthenogenesis and crossing-over in the grouse locust, Apotettix. **90,** liii, 131-42.

ARACHNIDA AND MYRIAPODA. **Brade-Birks, H. K. & S. G.**—Notes on Myriapoda: Some observations on nomenclature. **11,** iii, 253-6. **Dalmas, C.**—Synopsis des araignees de la famille des Prodidomidae. **24,** lxxxvii, 279-288 (cont.). **Muller, A.**—Ein beitrag zur kenntnis der weibchen der subfamilie Phalangiini. **89,** xli, Ab. f. Syst., 535-80. **Patten, B. M.**—Photoreactions of partially blinded whip-tail scorpions. (Jour. Gen. Physiology, Baltimore, i, 435-58.).

NEUROPTERA. **Whitehouse, F. C.**—Dragonflies of Alberta (with descriptive notes as a means to identification). (Alberta Nat. Hist. Soc., Red Deer, 16 pp.).

ORTHOPTERA. **Morse, A. P.**—New records of O. in New England. **5,** xxvi, 16-18.

Giglio-Tos, E.—Mantidi esotici. **25,** xlviii, 43-108.

HEMIPTERA. Parshley, H. M.—New England Hemiptera-Heteroptera, new records. **4**, 1919, 70-2. Tullgren, A.—Zur morphologie und systematik der Hemipteren, I. **28**, xxxix, 113-33.

LEPIDOPTERA. Buckholtz, O.—On the larvae of Datana chirigneusis. **16**, iii, 102. Dean, F. R.—Catocala season of 1918 in St. Louis County, Missouri. **17**, iii, 18-19. Dognin, P.—Heteroceres nouveaux de l'Amerique du Sud. Fasc. xvi, xv. Dyar, H. G.—Some Tropical American Phycitinae. Some Tropical American moths. **15**, vii, 40-63; 74-85. Ellsworth, A.—Butterfly names. **17**, iii, 19-21. Hampson, G. F.—Descriptions of new Pyralidae of the subfamilies Crambinae and Siginae [some neotropical]. **11**, iii, 275-92 (cont.). Hufnagel, A.—Recherches histologiques sur la metamorphose d'un lepidoptere (Hyponomenta padella). **92**, lvii, 47-202. Walker, F. H.—Synchronous movements in Vanessa antiopa larvae, with notes on the attractions of certain male L. by the females of their own species. **5**, xxvi, 13-16.

Busck, A.—Two [new] microlepidoptera injurious to strawberry. **10**, xxi, 52-3. Cassino, S. E.—A new Catocala. An undescribed form of Catocala aspasia. **16**, iii, 99; 103. Heinrich, C.—A new Olethreutid from New York. **15**, vii, 65-6.

DIPTERA. Barret, H. P.—Observation on the life history of Aedes bimaculatus. **15**, vii, 63-4. Cockerell, T. D. A.—The oldest mosquitoes. **76**, ciii, 44. Cole, F. R.—The cyrtid genera Thyllis and Megalybus. **4**, 1919, 54-62. Dyar, H. G.—A note on Argentine mosquitoes. **15**, vii, 85-9. Dyar & Knab—New sps. of tropical American mosquitoes. **15**, vii, 1-9. Koch, A.—Studien an larven von Culex pipiens bei der submersion. **52**, I, 105-111. Melin, D.—Nagra tankar om mimicry och skyddande likhet med stod av dipterologiska studier. **28**, xxxix, 239-94.

Dyar, H. G.—A note on Lesticocampa, and a new sp. [neotropical]. Westward extension of the Canadian mosquito fauna. **15**, vii, 9-11; 11-39. Johnson, C. W.—New sps. of the genus Villa (Anthrax) [Bombylidae]. **5**, xxvi, 11-13. McAtee, W. L.—Notes on the nearctic Nusa (Asilidae). **82**, xix, 244-8.

COLEOPTERA. Barber, H. S.—Avocado seed weevils. **10**, xxi, 53-60. Metcalf, C. L.—A malformed Leptinotarsa decemlineata. **5**, xxvi, 9-10.

HYMENOPTERA. Lovell, J. H.—The flower and the bee. Plant life and pollination. (New York. Charles Scribner's Sons, 1918.). Wheeler, W. M.—Two gynandromorphous ants. **5**, xxvi, 1-9. Wolff, M.—Proctotrupiden-gattung Lagynodes. **89**, xli, Abt. f. Syst., 581-606.

"The Wings of Insects," by J. H. Comstock, Emeritus Professor of Entomology and General Invertebrate Zoology in Cornell University. 4to, pp. XVIII.+430, plates i-x, figs. 1-427, and Bibliography. Published by the Comstock Publishing Co., Ithaca, N. Y. Price $3.75.

This fine volume marks the completion of the edifice which has been its author's life's work, viz., the study of the wings, and in particular the wing-venation, of insects. Though there are still some conservative entomologists who refuse to accept the Comstock-Needham system of notation for the wing-veins of insects, their number must be rapidly decreasing, and the system is indispensable to any student who would work beyond the limits of a single order.

Amongst the many fine chapters in this book, the author himself would probably be the first to acknowledge that the most important is that on the basal connections of the tracheae of the wings, by R. N. Chapman, M.A.—a quite original piece of work which stamps its author as one of the finest entomological dissectors of the age. Originally the study of these basal connections, as well as of the specializations at the bases of the veins themselves, was greatly neglected. In the present volume, a great advance has been made in overcoming this; but it is evident that much more remains to be done, and we must not accept this book as in any way the final decision on many important points. It is, perhaps, especially to be regretted that the author should have attempted to fix a single type of venation, with a definite number of branches, as the original possession of the first insects; for any student of the Palaeozoic fossils can only come to the conclusion that there was nothing more variable from the very first, than the number of branches of each of the main veins. In working from this type, and so determining every known type of venation in terms of it, the author falls into some grave errors of which, perhaps, the most serious is the determination to keep the cubitus two-branched in the Lepidoptera, the extra basal branch being explained as the first analis migrated over to join the cubitus. By this, the obvious homologies of the cubital branches in the Lepidoptera, with those of the older Megaloptera, Mecoptera and Planipennia, are entirely lost sight of.

The removal of the *Micropterygidae* from the Lepidoptera to the Trichoptera is the most drastic change from accepted classification proposed in the book. It is a good example of the kind of conclusion that can sometimes be reached by considering only one set of characters, and ignoring all the rest. But even from the point of view of wing-venation it is scarcely defensible, for a careful study of the freshly turned pupae of any of the older families of Lepidoptera will show that their wing-tracheation agrees closely with that of *Micropteryx*, particularly in the different courses of Cu and 1A in fore and hind wings. Moreover, the pupal wing of *Micropteryx* has a complete trache-

ation; the imaginal wings have broad, well developed scales of a higher type than any found in the Trichoptera; the forewing does not possess a separate M4; and the hind wing has a definite frenulum. In all these points this family is definitely Lepidopterous. Neither the larval form nor the imaginal mouth-parts are Trichopterous, so that there is really no justification for so radical a change, which must remain as a serious blemish in a fine work.

The most complete and detailed chapter is that upon the wings of the Neuroptera, in which much splendid original work is displayed. But here, more than anywhere else, the mistake of trying to work back to the supposed ancestral type is most evident, and a reference to the known Triassic and Liassic fossils, almost all of which are closely and densely veined, should have convinced the author that his theory was wrong in detail. Consequently, we have the statement made that *Hemerobius* is an archaic genus and *Megalomus* highly specialized, whereas the reverse is certainly the case: the Mantispidae are dealt with quite "in the air," instead of with their close allies, the Chrysopidae and Berothidae; and the Apochrysidae likewise.

In contrast with this, the painstaking working-out of the heteroneurism in the Myrmeleontoid families, without the aid of the pupal tracheation of the older families, is worthy of the highest praise; more recent studies of these pupae in Australia show Comstock's work to be correct in almost every particular.

There is one striking omission in the book, viz., the neglect to utilize the wing-trichiation as an aid to homologies. The importance of this cannot be over-estimated, especially in those orders in which the pupal tracheation fails, as in the Mecoptera, Trichoptera and Diptera. This failure accounts for two serious errors, viz., the interpretation of the limits of the media and cubitus in *Merope* and also in *Rhyphus* (and consequently in all Diptera). In both cases, an oblique vein carrying strong macrotrichia has been interpreted as a cross-vein, when, as a matter of fact, it is the basal piece of a branch of a main vein.

It should be noted that the author tacitly throws overboard the untenable "Meyrick's Law," which he espoused and christened in a much earlier work. Nearly all the original work in this book is a witness of the fallacy of this supposed "law." But perhaps it would have been better to have stated definitely the author's changed conception. It is harder to explain the failure of the author to deal with the unbranched radius theory in the Order Odonata; whether he agrees with it or not, he should surely not have ignored it completely, as he has done.

But when all these criticisms have been made, it remains to be said that the book is a magnificent piece of work, and well worthy of the labor that its talented author has spent upon it. To all entomologists

who would progress beyond the general level of stagnation, this book should be an absolute necessity; and the more of them who "read, mark, learn and inwardly digest" its contents, the better it will be for the future progress of Entomology.

The general appearance of the book could not be improved upon, the type being very clear, and the plates and text-figures as fine as we have seen. Only those who know the great difficulty involved in producing even only a moderately good photograph of a delicate wing-tracheation, can really appreciate the immense amount of skilled labor that must have gone to the making of the illustrations in this book. Plate I is a perfect masterpiece of technical art.—R. J. Tillyard.

Doings of Societies.

American Entomological Society.

Stated and annual meeting, December 9, 1918, in the hall of the Academy of Natural Sciences of Philadelphia. Vice President J. A. G. Rehn in the chair; fifteen persons present. The annual reports were read. The Publication Committee reported that Volume 44 of the *Transactions* had been completed, but that the *Memoirs* for 1918 had been delayed by war conditions. The death of Mr. Benjamin Hayes Smith, a member of long standing, was announced, together with the fact that his collection of Coleoptera had been given by him to the University of Pennsylvania some months previous to his death.

The meeting then proceeded to ballot for officers and committees for the year 1919, resulting in the following elections: President—Henry Skinner, Vice-President—J. A. G. Rehn, Corres. Sec'y—Morgan Hebard, Recording Sec'y—Geo. M. Greene, Treasurer—E. T. Cresson. Publication Committee—J. A. G. Rehn, E. T. Cresson, P. P. Calvert. Finance Committee, J. A. G. Rehn, D. M. Castle, Morgan Hebard. Property Committee—E. T. Cresson Jr., Morgan Hebard, Philip Laurent.—Capt. R. C. Williams, *Recording Secretary.*

Feldman Collecting Social.

Meeting of February 19, 1919, at the home of H. W. Wenzel, 5614 Stewart St., Philadelphia; six members present. Pres. H. W. Wenzel in the chair.

Coleoptera. Mr. Wenzel recorded, for J. Wagener Green, the finding of *Phyllotreta armoraciae* Koch at Easton, Pennsylvania, and read Chittenden's account from *Insect Life*, vii, p. 404, 1895, of the first record of this "horse-radish flea-beetle" found within a quarter of a mile of the Columbian Exposition Grounds at Chicago, Illinois. He exhibited his own specimens, which are from Okanchee, Wisconsin. General discussion followed.—Geo. M. Greene, *Sec'y.*

Entomological Books

Complete Set

Proceedings Entomological Society of Philadelphia, Vols. I–VI, and Transactions American Entomological Society, Vols. I–XL, with Supplementary Vol. XIV.

Price on application.

Catalogue No. 6

Just issued—142 pages—entirely devoted to Books on Insects.

Sent on application.

Leng's List

Send in your subscription for Leng's List of North American Coleoptera.

Price $5.50 unbound, including delivery.
Printed on one side only $7.00.

JOHN D. SHERMAN, Jr.

24 CLAREMONT AVENUE

Mount Vernon, New York

ENTOMOLOGICAL NEWS

published monthly, **excepting August and September**, in charge of the Entomological Section of The Academy of Natural Sciences, Philadelphia, and The American Entomological Society.

ANNUAL SUBSCRIPTION, $2.00 IN ADVANCE.

SINGLE COPIES 24 CENTS.

ADVERTISING RATES: Full width of page. Payments in advance.

One issue,	one inch,	$ 1.20,	two inches,	$ 2.40,	half page,	$ 4.00,	full page, $ 8.00
Five issues,	"	5.50,	"	11.00,	"	17.50,	" 35.00
Ten issues	"	11.00,	"	20.00,	"	35.00,	" 70.00

☞ All remittances, and communications regarding subscriptions, non-receipt of the NEWS or of reprints, and requests for sample copies, should be addressed to ENTOMOLOGICAL NEWS, 1900 Race Street, Philadelphia, Pa. *All Checks and Money Orders to be made payable to the* ENTOMOLOGICAL NEWS.

☞ All complaints regarding non-receipt of issues of the NEWS should be presented within three months from date of mailing of the issue. After that time the numbers will be furnished only at the regular rate for single copies.

☞ Not more than two issues will be replaced gratis through loss, in transit or in change of address, unless such have been registered, at the subscriber's expense.

☞ Address all other communications to the editor, Dr. P. P. Calvert, Zoological Laboratory, University of Pennsylvania, Philadelphia, Pa., from September 15th to June 15th, or at the Academy of Natural Sciences, from June 15th to September 15th.

TO CONTRIBUTORS.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" for each number into the hands of the printer five weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form and without covers, will be given free, when they are wanted; if more than twenty-five copies are desired, this should be stated on the MS. The receipt of all papers will be acknowledged. Proof will be sent to authors for correction only when specially requested.

SPECIAL NOTICE TO AUTHORS

Owing to increased cost of labor and materials, no illustrations will be published in the NEWS during 1919, except where authors furnish the necessary blocks, or pay in advance the cost of making blocks, and pay for the cost of printing plates. Information as to the cost will be furnished in each case on application to the Editor. Blocks furnished or paid for by authors will, of course, be returned to authors, after publication, if desired.

☞ The printer of the NEWS will furnish reprints of articles over and above the twenty-five given free at the following rates: Each printed page or fraction thereof, twenty-five copies, 15 cents; each half tone plate, twenty-five copies, 20 cents; each plate of line cuts, twenty-five copies, 15 cents; greater numbers of copies will be at the corresponding multiples of these rates.

500 PIN-LABELS, 25 CENTS! All Alike on a Strip.

Smallest Type. Pure White Ledger Paper. Not Over 4 Lines or 30 Characters (13 to a Line). Additional characters 1c. each, per Line, per 500, Trimmed.

C. V. BLACKBURN, 12 Pine St., STONEHAM, MASS., U. S. A.

1.

2.

3.

4.

5.

6.

7.

8.

9.

E.C.V-D.

BUPRESTIDAE FROM WESTERN UNITED STATES.—VAN DYKE.

1, 2, *Acmaeodera sinuata.*
3, *A sinuata sex-notata.*
4, *A. wenzeli.*
5, *A. wheeleri.*
6, *A. cubaecola.*
7, *A. marginenotata.*
8, *A. pubiventris.*
9, *A. pubriventris* var *lanata.*

Smithsonian Institution
MAY 1 0
Nat

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

THE ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XXX. JUNE, 1919. NO. 6.

CONTENTS:

VanDyke—New Species of Buprestidae (Col.) from the Western United States, with Supplementary notes concerning others 151
Winn—Argynnis apacheana Skinner and Edwards' Plates of A. nokomis (Lep.)..... 156
Calvert—Odonata Zygoptera from Guatemala..... 160
Emerton—The Flights of Spiders in the Autumn of 1918 (Arach., Aran.) 165
Tillyard—A Further Note on the Wing-Coupling Apparatus in the Family Micropterygidae (Lep.)..... 168
Lindsey—A New Skipper from South America (Lepid., Hesperidae) 169
Metcalf—Eumerus strigatus again (Dip., Syrphidae) 170
Schaus—A new Amastus from Argentina (Lep., Arctiidae) 174
Editorial—A League of Nations Means the Metric System 175
Editorial—Stop Thief! 175
Entomological Literature 176
Doings of Societies—Ent Sec., Acad. Nat. Sci. (Orth., Lep.) 179
Feldman Collecting Social (Dip., Lepid., Coleop.)..... 179
Obituary—Eliza Klages..... 180

New Species of Buprestidae (Col.) from the Western United States, with Supplementary notes concerning others.

By EDWIN C. VAN DYKE, University of California, Berkeley, California.

(Plate VII.)

This paper embodying the descriptions of certain new species and notes pertaining to others, will constitute the third short paper dealing with the *Buprestidae* which I have written. It is presented like the previous ones[1, 2] with the idea of increasing our knowledge of this interesting family.

[1] "New Species of Buprestidae (Col.) from the Pacific States," by Edwin C. Van Dyke, Entomological News, Vol. xxvii (1916), pp. 405-412.

[2] "New Species of Buprestidae (Col.) from the Pacific States," by Edwin C. Van Dyke, Entomological News, Vol. xxix (1918), pp. 53-58.

Acmaeodera sinuata n. sp. (Pl. VII, fig. 1).

Form moderately depressed, bronzed, clothed with rather long erect hair which is black on the disc of elytra, apex of pronotum, and base of head, white on anterior part of head, basal part of pronotum, and sides of elytra, thorax without yellow side markings, each elytron with a broad yellow lateral band, somewhat roseate on inner margin, commencing at the humeri, at first as a narrow marginal band, then suddenly broadening and continuing as such with a sinuate inner border to near the apex.

Head rather densely, coarsely punctured and sulcate, clypeus broadly and moderately deeply emarginate; thorax twice as wide as long, apex slightly bisinuate, base truncate, sides slightly arcuate, broadest one-third distance in front of base, and narrowed at apex, margin narrow, only partly visible from above, surface somewhat densely and coarsely punctured, a slight median basal impression and oblique lateral.

Elytra as wide at base as the thorax, sides subparallel from base to beyond the middle, thence gradually narrowed to apex, margin serrate posteriorly, disc convex, punctato-striate, punctures moderately coarse, intervals with single row of punctures somewhat less than half as prominent as those of striae.

Body beneath bronzed, coarsely and closely punctured over thorax, rather finely and sparsely on abdomen, moderately clothed with rather long white hair, the anterior prosternal margin sinuate, the last ventral bluntly rounded and without carina.

Length 9 mm., breadth 3.25 mm.

This very distinct species belongs in the emarginate group as defined by both Horn[3] and Fall,[4] though some specimens show a tendency toward having a trisinuate prosternal margin. The facies of the species is also somewhat like that of *A. jocosa* Fall in the sinuate group and the markings suggestive of those given in the description of *A. horni* Fall. It however belongs near *A. prorsa* Fall, but differs from that as well as from *A. horni* Fall by lacking the broadly dilated prothorax and cuneate form. Its markings will enable it to be readily separated from all of our other species. The markings are not constant, though, for the yellow band may have its inner margin almost straight, as shown in Fig. 2, or be broken, form-

[3] "Revision of the Species of Acmaeodera of the United States," by George H. Horn, M.D., Trans. Am. Ent. Soc., Vol. vii (1878), pp. 2-27.

[4] "Synopsis of Species of Acmaeodera of America, North of Mexico," by H. C. Fall, Journ. New York Ent. Soc., Vol. vi (1899), pp. 1-37.

ing spots as in the variety described below. Intergrades however exist which link them all together.

The species so far as I know is confined to California, though widely distributed there as well as uncommon. I have seen one specimen from the Sierra Madre Mountains of Los Angeles County, collected July 6, 1912, by J. C. Bridwell and now in the collection of the Division of Entomology, University of California; five from near Placerville, including specimens collected by H. E. Burke, F. H. Herbert, and the type, one from Hullville, Lake County, collected by L. R. Reynolds, and three from Los Gatos, collected by F. H. Herbert. The material secured by Mr. Burke and Mr. Herbert was taken on *Ceanothus cuneatus* Nutt.

Type in my own collection, collected above Placerville along the Placerville road, El Dorado County, June 9, 1906, by F. W. Nunenmacher and by him kindly presented to me.

Acmaeodera sinuata sex-notata n. subsp. (Pl. VII, fig. 3).

Like typical form except proportionately broader and with the lateral yellow band broken up into large spots. These are situated, one just posterior to the humeri, a second at about the middle of the sides, and a third between that and apex with a trace of a fourth slightly posterior to the last. The three large spots are all somewhat transverse, extending from the margin of the elytra inwards to almost the second stria in the case of the first, almost to the third stria in the second, and to the third in the third. Length 9.5 mm., breadth 4 mm.

This variety superficially resembles in size, shape and markings typical forms of *A. robusta* Horn. It can however readily be distinguished from that by lacking the yellow spots of the thorax as well as by its more bronzed elytra and less sinuate anterior margin to prosternum. While all the specimens in the lot from which the type was taken are broad, others have been seen which were of the exact shape of typical *sinuata*. These were also taken in company with the latter. I have seen four specimens of the broad form in the collection of Dr. F. E. Blaisdell and know that Mr. L. R. Reynolds also possesses some six or eight taken at the same time and place as the type and from *Ceanothus cuneatus* Nutt., and two specimens of the narrower phase in the collection of Mr. H. E. Burke, both

bred from *Ceanothus cuneatus* Nutt. that was secured from Placerville.

Type in my own collection, collected at Hullville, Lake County, Cal., June 14-17, 1917, by Dr. F. E. Blaisdell, to whose generosity I am indebted for the same. Paratypes are in Dr. Blaisdell's collection.

Acmaeodera wenzeli n. sp. (Pl. VII, fig. 4).

Form elongate, subparallel, slightly depressed, bronzed, elytra with a bluish tinge, sparsely covered above with moderately long, erect, black hair, changing to white laterally, prothorax unicolorous, each elytron with three distinct yellow maculations placed as follows: One triangular blotch placed halfway between base and apex and extending slightly forward along margin and inwardly four intervals from the margin, a second fascia between this and apex and extending from the third stria obliquely outward almost to margin, the third a small spot placed subapically and on the third and fourth intervals (in my specimen there is also a fourth spot on right elytron between the second and third maculation).

Head moderately coarsely and sparsely punctate, no frontal carina, clypeus deeply semicircularly emarginate, antennae with fifth joint suddenly dilated; thorax less than twice as wide as long, apex and base subtruncate, sides rounded in front, parallel and straight for posterior two thirds, margin fine, not visible from above, disc with a slight median basal impression and a deeper one each side midway between this and the posterior angles, the latter the terminations of shallow oblique lateral impressions, the disc rather finely and sparsely punctate and the sides coarsely and cribrately punctured.

Elytra as wide at base as the thorax, umbones feebly prominent, sides slightly sinuate to posterior two-thirds where elytra are widest, thence gradually convergent and rounded to apex, margin slightly serrate posteriorly, disc somewhat convex, striae finely impressed anteriorly, quite deeply posteriorly, and with rather coarse punctures basally and fine apically, intervals flat and with a single series of fine punctures.

Body beneath coarsely, densely punctured anteriorly, finely, sparsely over abdomen, clothed with long white hair, the anterior margin of prosternum subtruncate, the last ventral with distinct subapical carina.

Length 9.25 mm., breadth 3.25 mm.

This species belongs with the species having a truncate prosternal margin and is close to *A. consors* Horn, from which it differs by having a different type of maculation as well as a diverse shape, particularly in respect to the prothorax, and

another style of punctuation. The unicolored thorax as well as the deeply emarginate clypeus will always enable this to be separated from the darker and narrower phases of *A. pulchellus* Herbst and its allies.

Type in my collection, collected in the Chisos Mountains, Texas, July 19, by Mr. H. A. Wenzel and kindly presented to me by his father, Mr. H. W. Wenzel, after whom I take pleasure in naming it. Two other specimens are now in the collection of Mr. Wenzel.

Acmaeodera wheeleri n. sp. (Pl. VII, fig. 5).

Form elongate, subparallel and subcylindrical, head and prothorax markedly bronzed, the latter with a small obscure yellow spot near posterior angles, the elytra a deep blue, each elytron with two rows of large yellow spots, the discal with four, one subbasal, one subapical and two between equally distant from each other and the nearest of these, the marginal with three spots which practically alternate with the discal, the head and thorax clothed with short white semi-erect squamulose hairs, the elytra with rows of short white semi-erect setae, the latter arising from the punctures of the elytral intervals.

Head coarsely, shallowly, cribrately punctured, the clypeus rather deeply emarginate, antennae with fifth joint suddenly dilated; thorax two-thirds as long as broad, base truncate and apex bisinuate, broader at base than apex and broadest at middle, sides evenly though slightly arcuate, margin narrow and concealed from above, surface closely, evenly, cribrately punctured, three basal foveae, one at middle, the other at either side and midway between middle and posterior angles.

Elytra twice as long as wide, as wide at base as the thorax, umbone feebly prominent, sides slightly sinuate in front and gradually narrowed from just beyond middle to apex, margins moderately serrate posteriorly, disc convex, striae deeply impressed, especially near suture and at the sides, and punctured with large approximate punctures, the inner intervals slightly flattened, the outer convex, with single row of fine punctures down the centre from which project short semi-erect setae.

Body beneath rather coarsely, closely punctured anteriorly, more finely and sparsely over abdomen, densely clothed with white recumbent squamulose hairs, the anterior margin of prosternum truncate, the last ventral with a short subapical carina. Length 9.5 mm., width 3 mm.

This elegant and very distinct species likewise belongs with the species having a truncate prosternal margin. It should be

placed next to *A. cribricollis* Horn with which it agrees in general size, form and in regard to the cribrate type of prothoracic punctuation. It, however, differs markedly from this in regard to its coloration, the type of vestiture, and so on, and bears no resemblance whatever to any of our other North American species.

Type and paratype in my collection, collected in the Sabino Canyon, Santa Catalina Mountains, Arizona, July 23, 1917, by Prof. W. M. Wheeler and by him kindly presented to me. Several other specimens are now in Prof. Wheeler's possession. The species is named in honor of its captor.

(To be continued.)

Argynnis apacheana Skinner and Edwards' Plates of A. nokomis (Lep.).

By Albert F. Winn, Montreal, Canada.

It is not without a certain amount of fear and trembling that I venture to make a few remarks on a species of this most perplexing genus of butterflies.

Under the name of *A. nokomis* Edw. we acquired last month for the collection of the Lyman Entomological Room, McGill University, a perfect pair of the species, which has been known under that name until a few months ago when Dr. Hy. Skinner rechristened it as *Argynnis apacheana*.[1]

There seems to be no doubt that he is correct in his contention that the single male specimen that Edwards received in 1862 and described in the Proceedings of the Academy of Natural Sciences,[2] under the name of *A. nokomis,* is identical with what he afterwards described as *A. nitocris*[3] from another single male example, and that, therefore, *A. nitocris* Edw. becomes a synonym of *A. nokomis* Edw.—leaving the species described as *A. nokomis,* with figure showing both sexes and upper and lower surfaces in plate[4]—in need of a name, which Dr. Skinner has now supplied—*apacheana.*

[1] Ent. News, XXIX, 67-68, Feb., 1918.
[2] Proceedings of the Acad. Nat. Sc. of Philadelphia, 1862, p. 221.
[3] Trans. Am. Ent. Soc. V (not XV as quoted in Ent. News), p. 15 (1874).
[4] Edwards, Butterflies of N. A., Vol. I, pl. IV of Argynnis, pp. 73-74; 1873 (not 1868).

There is one statement made by Dr. Skinner which appears to need modification or explanation; namely, that Edwards *did not publish* the plate drawn by D. Wiest, showing the male that he had described in 1862.

In Vol. I, Butterflies of North America, p. 175, (following the author's instructions regarding pencilling in the numbers for plates and text pages), is given a list of "Dates of Issue of Parts 1-10." Part 1 reads as follows: "June, 1868, (on cover April, 1868) containing *Argynnis Diana, A. cybele, A. aphrodite, A. nokomis, A. atlantis.*" That the part was duly sent out is shown by the following quotation from *The Canadian Entomologist* under the heading of "Review of New Entomological Works":[5] "The part contains 5 large 4to plates of these various species of *Argynnis,* viz., *A. diana, cybele, aphrodite nokomis* and *atlantis,* accompanied by descriptive letter press of a valuable character."

In Kirby's Catalogue[6] the reference to *Argynnis nokomis* Edw. reads: "Proc. Ac. Na. Sc., Phila., p. 221 (1862) But. of N. Am. I, iv (1868);" the locality is cited as Montana.

Edwards, Synopsis,[7] species 4, of *Argynnis* reads "*nokomis* ♂ Edw. Proc. Ac. Na. Sc., Phila., 1862, ♂ But. N. A., pl. iv of *Argynnis* (1868)."

It therefore seems quite evident that Part I, with its 5 plates, including that of *nokomis,* male only, drawn by D. Wiest, and accompanying letter-press for each, was duly forwarded to subscribers.

A further reference to "Dates of Issue" shows Supplement, Jan., 1873, "containing new plates of *Argynnis diana, A. nokomis, A. leto.*" So it seems that, after five years elapsed since the plates of *A. diana* and *A. nokomis* were issued, new plates were made and sent out with new letter press likewise, but whether subscribers were requested or instructed to replace the originals by the revised ones or not I have no means of knowing, but there seems no doubt both were issued; in fact, in the

[5] Can. Entom. I. pp. 22-23, Toronto, Oct. 15, 1868.

[6] Synonymical Catalogue of diurnal Lepidoptera, p. 157, 1871.

[7] Synopsis of N. A. Butterflies, p. 12, Phila., 1872, (also in reprint of 1879).

Odonata Zygoptera from Guatemala

Collected by Messrs. William Schaus and John T. Barnes.

By Philip P. Calvert, University of Pennsylvania, Philadelphia, Pa.

This paper is essentially a continuation of that published in the News for February and March, 1919, to which reference should be made for general information concerning localities visited by the collectors.

Calopteryginae.

Hetaerina cruentata (Rambur). Chejel, June, 1917, 1 ♂. San Felipe, February, 1 ♀.

I postpone until a later occasion a consideration of the differences stated by Dr. Ris (Archiv. f. Naturges., 1916, A, 9, 1918) to exist between the females of *cruentata* and *caja*.

Hetaerina tricolor (Burmeister). Cayuga, bananas, October 29, 2 ♀ (1 teneral), November 23, 1 ♂. Quirigua, February 21, 1 teneral ♂; forest, February 22, 1 teneral ♀, March 30, 1 ♀. All these specimens have well-developed pterostigmata.

Hetaerina titia (Drury). Cayuga, April 20, 1 ♂; edge of forest, April 30, 1 ♀; forest, May 3, 1 ♂, May 8, 1 ♀; in banana trail, May 25, 1917, 1 ♀; forest stream, May 29, 1 ♂; forest, June 1, first good rain yesterday, 1 ♀, "entirely black, white spots [= pterostigmata] on tips"; forest, August 14, 1 teneral ♂; August 29, 1 ♂. Quirigua, forest, March 30, 1 ♂. The Cayuga male of August 29 has no pterostigma on any wing; all the other individuals of both sexes have this distinctly developed.

Mr. Williamson (Ent. News, xxiii, pp. 98-101, March, 1912) has come to the conclusion "that in the United States one variable species hitherto known as *Hetaerina titia* and *H. tricolor* exists." His evidence, which I am quite disposed to accept, refers only to the males. If these two nominal species are in reality variants of but one, we should find gradations from the females of *tricolor* to females of *titia*. In a key to the females of *Hetaerina* in the Biologia volume, page 21, I separated *tricolor* from a number of other species as follows:

"*b*. Metallic green on either side of the thoracic dorsum (mesepisternum) divided into two spots, the anterior contiguous to the middorsal carina, the posterior separated from it by buff or brown,

tricolor

bb. Metallic green of each mesepisternum continuous, contiguous to the mid-dorsal carina (or nearly so) throughout its entire length, *titia* and other species

We should, then, find females in which the anterior and posterior metallic green spots of *tricolor* females approach and finally fuse with each other and some in which the posterior spot becomes connected with the mid-dorsal carina. The present Guatemalan material does not furnish any of these intergradations, but two females from the Rio Machuca, Costa Rica, January, 1907, by Prof. P. Biolley, cited on page 345 of the Biologia, afford some of the intermediate conditions sought for.

One of them has the upper end of each posterior (superior) metallic green spot connected by a narrower curved stripe of metallic blue with a black line which runs contiguously to the whole length of the mid-dorsal carina; the distance between the anterior and posterior metallic green spots however is greater than the greatest dimension of the anterior spot.

The other female has the posterior metallic green spot more broadly connected at its upper end with a narrow metallic green stripe which borders the black line that, as in the first female, runs contiguously to the whole length of the mid-dorsal carina; this narrow, bordering metallic green stripe unites with the postero-mesal angle of the anterior metallic green spot. This latter female suggests that a broadening laterad of the "narrow, bordering metallic green stripe" may be the method by which the transition from the thoracic pattern of typical *tricolor* female to that of typical *titia* female is made.

Hetaerina macropus Selys. Cayuga, forest stream, May 31, 1 ♂. Escuintla, February, 1 ♂, July 10, 1 ♀. Mazatenango, in forest, July 19, 1 ♂.

The Escuintla ♂ has no stigma on one front and one hind wing, the ♀ none on the right hind wing; in all three wings a more oblique thickened postnodal (postcubital) cross-vein represents the missing part. The female differs from the characters stated for *macropus* on page 347 of the Biologia volume (under *H. capitalis* ♀) in that the metallic green stripe on the mesepimeron reaches to the upper end of the sclerite. *If* the differentials of the females of *macropus* and of *capitalis* there given be correct, one female (at least) from Cacao, Alta Vera Paz, Guatemala, referred to *macropus* on page 346 of the volume should be corrected to *capitalis.*

Hetaerina capitalis Selys. Cayuga, forest stream, May 31, 1 ♂, "body black, thorax with oblique dark brown streaks; base of

wings crimson, below with lilacine streak"; forest, June 4, 1 ♂. Volcan Santa Maria, 5000 feet, April 19, ♂ ♀ "in cop."

The lengths of the abdomens and hind wings of the three males and one female, respectively, are: 41.5, 29.5; 36.5, 27; 43, 35; 36, 34 mm. All four specimens have pterostigmata.

Cora marina Selys (race **alcyone** Selys?). Cayuga, near stream in bananas, May 28, 1 ♀, "Black with subdorsal dark grey interrupted streak. Ventrally dark grey." Abd. 28, hind wing 26 mm. Front wings: from base to nodus 13.5, from nodus to apex 14 mm.; 29 antenodals, the 11th thicker, 24 (right), 22 (left) postnodals; extreme length of the stigma 3.22, its costal edge 2.38 mm. The nasus is crossed by a median black band .35 mm. in width. The mid-dorsal black band on abdominal segments 2-7 is wider on each segment than on that preceding and on all of them wider than the lateral pale band; in side view of the abdomen the half of this mid-dorsal black band that is visible is from one-sixth (on 2) and one-fourth (on 3), to one and one-half times (on 7), as wide as the pale lateral band. The black mid-dorsal thoracic stripe is at its narrowest place .59 mm. in width, and the black stripes on the humeral and first lateral sutures reach widths of .35 and .21 mm. respectively.

This female is similar to Costa Rican females which I have referred* to *marina* or to forms intermediate between *marina* and *alcyone*, but is still smaller and with more black on all three regions of the body. Dr. Ris, writing of specimens of *marina* from Panama and Bugabita in Panama, says:

"Die Serie entspricht somit den kleinen Massen [der *C. marina*] bei Calvert, und bei Selys den Massen der *C. alcyone* (3. Addit. Synops. Calopt., p. 39, 1873, ♂ Bogota). Diese ist so gut wie sicher keine besondere Art, sondern mit diesen kleinen Exemplaren der *C. marina* identisch." (Archiv f. Naturges., 1916, A, 9, p. 19, 1918.)

LESTINAE.

Lestes tenuatus Rambur. Cayuga, caught on verandah, May 24, 1 ♀. "Thorax dark green with lateral black stripe, pale green below stripe. Abdomen olive brown above; fine whitish segmental lines ant[erior]ly and fine black lines posteriorly on each segment. Abd. whitish brown below."

Not previously recorded from Guatemala, although known both to the north and to the south.

* Calvert, A. S. and P. P., 1917. A Year of Costa Rican Natural History, New York, Macmillan, p. 368.

AGRIONINAE.

Megaloprepus coerulatus (Drury). Cayuga, forest, May 24, 1 ♂, May 28, 1 ♂. Both specimens agree with the characters given for *M. coerulatus coerulatus* by Dr. Ris (Archiv. f. Naturges., 1916, A, 9, p. 68, 1918).

Pseudostigma aberrans Selys. Cayuga, April 19, 1 ♂, April 21, 1 ♂; forest, May 27, 1 ♂. Mazatenango, May, 1 ♀.

In all three males the false pterostigma stops short of reaching the end of the "median vein" (R) by a distance less than its own length, but its length is much less than in the material described in the Biologia volume, page 54, being on front and hind wings for the three males respectively, measured in a straight line from end to end on the wing-margin, 6, 7; 6, 6.5; 7, 7.5 mm. The number of cells in the first "row," i. e. between C and R, is 14-24, and in the second "row," i. e. between R and M1, is 3-7, front and hind wings affording nearly equal variations.

Pseudostigma accedens Selys. Quirigua, February 24, 1 ♀, abd. segs. 8-10 lacking.

The false pterostigma occupies three rows of cells on both front and hind wings; hind wing 60 mm.

Mecistogaster ornatus Rambur. Escuintla, February, 1 ♀.

Mecistogaster modestus Selys. Cayuga, Rio Negro trail, forest, April 30, 1 ♂, 1 ♀; forest, May 3, 1 teneral ♀, June 7, 1 ♀. Quirigua, March 10, 1 ♂; forest, March, 1 teneral ♂. Purulhá, forest, July 7, 1 ♂. Escuintla, forest, March, 1 teneral ♂.

Some remarks on the taxonomy of this species subsequent to the publication of the Biologia volume will be found in Ent. News, xxii, p. 457, December, 1911, and by Dr. Ris, Archiv. f. Naturges., 1916, A, 9, p. 73, 1918.

Heteragrion tricellulare Calvert. Purulhá, July 11, 1 ♂.

Heteragrion alienum Williamson (Occas. Papers, Mus. Zool. Univ. Mich., No. 68, p. 33, 1919). Cayuga, forest river, March 21, 1916, 3 ♂, "all pale markings orange"; forest stream, April 5, 1 ♂; forest, May 3, 1 ♂; forest, June 4, 1 ♂.

Argia pulla Hagen. Cayuga, bananas, October 29, 1 ♂.

Argia oculata Hagen. Cayuga, forest, April 25, 1 ♂, 1 ♀. The ♀ has the labrum black with two small pale spots, no pale mid-dorsal or inferior longitudinal lines or stripes on abdominal segment 5 but the mesostigmal lamina agrees with figure 11, pl. IV of the Biologia.

Argia difficilis Selys. Cayuga, April 19, 1 ♀; Quirigua, forest, March, 1 ♀.

Prof. Foerster has remarked (Archiv. f. Naturges., 80ter Jahrg., 1914, Abt. 2, 2 Heft, p. 66):

In Synopsis des Agrionines hat De Selys ein ♀ als *A. difficilis* beschrieben, von Jurimaguas in Peru. Calvert identifiziert damit eine *Argia* vom *oculata*-Typus von Zentral-Amerika, Kolombia und Ekuador. Ich halte diese aber für die typische *oculata*. Selys beschreibt letztere von Venezuela. Ich besitze Ecuador-Exemplare, welche mit Hagens Abbildung in den Appendices übereinstimmen. Von Madre de Dios in Peru liegt ein Männchen vor, welches ich für typischer halte als Calverts Exemplare.

From his description of this male I quote only the following:

Pterostigma rhomboid, Innenseite und Aussenseite ziemlich gleich, die hintere kaum länger, Vorderseite etwa 6/5 der hintern.

Prof. Foerster says nothing as to whether his Madre de Dios male is conspecific with de Selys' female type of *difficilis*, and until this is positively ascertained one cannot be sure that he has correctly identified his specimen. In favor of his view, indeed, is de Selys' statement: "ptérostigma brun, plus foncé au centre, rhomboïdal aussi long que large, surmontant une cellule," whereas in the specimens which I have regarded as *difficilis* the stigma is longer than wide, as the following measurements show:

"Difficilis" ♀, Cayuga, April 19, fore wing, stigma, anterior side .9, posterior side .9, proximal side .78, distal side .78 mm. These measurements were all made from the *outside* of the enclosing veins; corresponding measurements of the same stigma made *inside* the enclosing veins are .78, .78, .55, .61 mm.

"Difficilis" ♀, Quirigua, March: .86, .9, .77, .65 (.78, .69, .53, .53) mm.
"Difficilis" ♂, Bucay, Ecuador: .86, .86, .57, .61 (.77, .69, .45, .49) mm.
Oculata ♂, Cayuga, April 25: .82, .82, .61, .61 (.69, .65, .49, .49) mm.
Oculata ♀, Cayuga, April 25: .94, .96, .77, .65 (.82, .82, .61, .57) mm.

Dr. Ris (Archiv. f. Naturges., 1916, A, 9, p. 107, 1918) has accepted my interpretation of *difficilis* and makes no reference to the views of Prof. Foerster; it is of interest to note that he quotes 1 ♂, 2 ♀, Oberer Madre de Dios, Peru, as of *A. oculata* (*t. c.*, pp. 105-6).

Argia cuprea Hagen. Cayuga, January, 1918, ♂ ♀ "in cop."; they are of the "form a" of Dr. Ris (Archiv f. Naturges, 1916, A, 9, pp. 110-112, 1918).

Argia extranea Hagen. Purulhá, October, 1 ♀.

Acanthagrion gracile (Rambur). Quirigua, March 1, 1915, 1 ♂. Like other Central American and Mexican examples, this will

probably require another specific name when the penis of the type of *gracile* shall have been examined.

Telebasis digiticollis Calvert. Cayuga, house, October 25, 1 ♀.

Metaleptobasis bovilla Calvert. Cayuga, house, September 2, 1917, 1 ♂.

The single (type) ♂ was imperfect, wherefore the following: rhinarium and labium yellow, antennal joints following the second very slender, blackish. Prothorax orange, unmarked, hind lobe low, convex, apparently entire. The transverse basal pale rings on abdominal segments 2-8. Ultra-nodal sector (M1a) arising at the ninth postnodal on the hind wings (11 postnodals in hind wings), upper sector of triangle (Cu1) ending at level of eighth or ninth postnodal (front wings) or eighth (hind wings).

Mr. Williamson also has described a single male of this species from near Puerto Barrios, Guatemala, taken June 23, 1909. (Proc. U. S. Nat. Mus., Vol. 48, pp. 602, 604, 1915.)

Palaemnema sp. Cayuga, forest, April 25, 1 teneral ♀, abd. segs. 7-10 lacking.

Neoneura aaroni Calvert. Cayuga, house, bath-room, August 28, 1 ♂, of the very young stage (*a*) of the original description (Biologia, p. 139), the hind wing a little longer, (18 mm.).

This species has not been found previously south of Texas. Additional figures have been published by Mr. Williamson (Trans. Amer. Ent. Soc., xliii, p. 241, 1917).

The Flights of Spiders in the Autumn of 1918 (Arach., Aran.).

By J. H. Emerton, Boston, Massachusetts.

The Indian summer of 1918 came on early, and continued in periods of two or three days at short intervals until the last of November. October 9 was one of the first of these days, and at noon eight species of spiders were noticed on garden fences in Cambridge, Massachusetts, some of them making efforts to fly. Favorable weather continuing the next day, I went to my usual autumn hunting ground at Readville, just south of Boston, where a long stretch of wire fences furnish landing places for the spiders flying from several miles of marsh along the Neponset River. Twenty-eight species of spiders were found between the hours of ten and twelve, most of them of

species that might have been swept from the tall grass and low bushes of the neighboring fields at any time during the summer. The only adults were six species of Attidae, but one of them, *Zygoballus terrestris,* a regular autumn flyer. The small Linyphiadae, which are so characteristic of the late autumn flights, were entirely absent. The flying went on several days of the following week, and on October 17 twenty-six species were taken, three of them adult Attidae, and eight adult small Linyphiadae that live in the summer near the ground, among grasses and other low plants. As the season went on the number of Linyphiadae increased and that of the Attidae and Thomisidae diminished, only *Xysticus quadrilineatus* continuing through the season, with *Misumena asperata* abundant the first two weeks. *Tmeticus bostoniensis* and *Diplostyla alboventris* came in on October 17 and, opposite certain fields, continued abundant through the season.

Of the regular fliers the young of all the species of *Pirata* and *Pardosa* increased in numbers until the very last of the season, and at all times there were some individuals of *Epeira prompta, Epeira displicata, Singa variabilis, Anyphoena rubra* and *Dolomedes sexpunctatus.* The largest number of species and of individuals was taken on November 8, when there were adults of twelve species of Linyphiadae and young of two others, with great numbers of young Lycosidae of all kinds.

The best flying weather of the season occurred November 16 between 9.30 and 10.30 A. M., when a hundred spiders of the species listed under that date were taken. At that time there was no wind that could be felt, and several half-grown *Pardosa* were seen to rise vertically from fence posts until out of sight. At 10.30 the wind rose slightly and changed to the east, and the flying stopped. Nothing new in regard to the method of flight was observed this season. Several spiders, while ascending, were seen to draw out a thread attached to the starting point. Several species were seen to drop and hang swinging by a thread, two or three inches long, and in this position to let out flying threads and drift away in the air.

Sixty-nine species in all were observed. Very young *Epeira insularis* and *trifolium* show that these species sometimes de-

velop far enough to leave the cocoon in the fall, instead of waiting until spring. The accompanying table shows the species seen on fences during some of the largest flights and their changes through the season. Only those with the sex marks were adult, but many others were within one molt of maturity, including *Lophocarenum florens, Dictyna volucripes, Linyphia phrygiana, Anyphoena rubra* and *Pardosa glacialis,* all of which mature very early in the spring. The Lycosidae were of all sizes, most of them very small, while other individuals of the same species were nearly ready for the final molt.

	Oct. 10	Oct. 17	Oct. 23	Nov. 7	Nov. 8	Nov. 16
Theridion murarium	—	—	—	—	—	—
Theridion frondeum	. . .	. . .	. . .	. . .	—	. . .
Crustulina guttata	. . .	. . .	. . .	. . .	. . .	—
Enoplognatha marmorata	. . .	. . .	. . .	. . .	—	. . .
Mimetus interfector	. . .	. . .	. . .	—	. . .	. . .
Ceratinella brunnea	. . .	—♂♀	. . .	. . .	—♂	—♂
Ceratinella emertoni	. . .	. . .	. . .	. . .	—♂	—♂
Ceratinella minuta	. . .	—♂	—♀	. . .	. . .	. . .
Cornicularia directa.....	. . .	—♀	. . .	. . .	. . .	. . .
Cornicularia indirecta ...	. . .	—♂	—♂♀	. . .	—♂	—♂♀
Cornicularia communis ..	. . .	. . .	. . .	. . .	—♂	—♂♀
Spiropalpus spiralis	. . .	—♂	. .	—♂	—♂	—♂
Gonatium rubrum	. . .	—♀	. . .	—♀	—♂	. . .
Grammonata ornata	. . .	. . .	—♀	. . .	. . .	. . .
Lophocarenum florens ..	. .	. . .	. . .	—	—	—
Lophocarenum spiniferum	. . .	. . .	. . .	—♂	. . .	—♂
Lophocarenum crenatum	. . .	. . .	. . .	. . .	—♀	. . .
Tmeticus trilobatus	. . .	—♂	. . .	—♂	. . .	. . .
Tmeticus bostoniensis ..	. . .	—♀	—♂♀	—♂♀	—♂♀	—♂♀
Tmeticus plumosus	. . .	. . .	. . .	—♂	. . .	—♂
Erigone dentigera	. . .	—♂	. .	. . .	—♂	—♂
Micronета rectangulata .	. . .	. . .	—♂	. . .	—♂	. . .
Bathyphantes angulata ..	. . .	. . .	. .	. . .	—♂	. . .
Bathyphantes zebra	. . .	. . .	. . .	—♂	. . .	. . .
Diplostyla alboventris ...	. . .	. . .	—♂	—♀	—♂♀	—♂♀
Diplostyla concolor	. . .	. . .	—♀	. . .	. . .	. . .
Linyphia clathrata	. . .	. . .	. .	—	—	—
Linyphia marginata	. . .	. . .	. . .	—	. . .	. . .
Linyphia phrygiana	. . .	. . .	. . .	—	. . .	. . .
Epeira stellata	. . .	—	—	. . .	. . .	. . .
Epeira prompta	—	—	—	—	—	—
Epeira patagiata	—	—	—	. . .	. . .	. . .
Epeira displicata	—	. . .	. . .	—	—	—
Epeira insularis	—	. . .	. . .	. . .	. . .	. .
Epeira trifolium	—	. . .	. . .	. . .	. . .	.
Singa variabilis	—	—	—	—	—	—
Tetragnatha laboriosa ...	. . .	. . .	. . .	. . .	—	. . .
Dictyna volucripes	. . .	—	. .	—	. . .	. . .

	Oct. 10	Oct. 17	Oct. 23	Nov. 7	Nov. 8	Nov. 16
Lycosa nidicola	—					
Lycosa lepida			—			
Pirata minuta		—	—	—		
Pirata insularis	—	—	—	—	—	—
Pardosa glacialis	—	—	—	—	—	—
Pardosa nigripalpis	—	—	—	—	—	—
Pardosa diffusa						—
Dolomedes sexpunctatus	—				—	
Pisaura undata					—	—
Anyphaena rubra	—	—	—			—
Anyphaena saltabunda	—	—				
Cheirocanthium viride	—					
Prosthesima atra			—			
Misumena asperata	—	—				
Coriarachne versicolor					—	
Xysticus quadrilineatus	—	—	—			—
Xysticus gulosus		—				
Xysticus stomachosus				—		
Tmarus caudatus	—					
Philodromus pictus	—				—	—
Tibellus oblongus			—	—	—	
Phidippus tripunctatus	—					
Phidippus multiformis	—♀		—♀			
Wala mitrata	—					
Zygoballus bettini	—♀					
Zygoballus terrestris	—♂♀	—♂♀	—♂			
Epiblemum scenicum	—♂♀					
Salticus cohippiatus	—					
Icius hartii	—					
Dendryphantes aestivalis	—♂♀	—♂♀			—	
Dendryphantes militaris	—♂	—♂♀				

A Further Note on the Wing-Coupling Apparatus in the Family Micropterygidae. (Lep.).

The short note made by the author on this subject in Ent. News, Vol. xxix, p. 90 (March, 1918), needs correction in an important particular. The study was carried out on the five genera *Micropteryx*, *Sabatinca*, *Mnesarchaea*, *Eriocrania* and *Mnemonica*. Of the first three genera plenty of good material was available, and the results obtained were undoubtedly correct. Of the other two, the author had unfortunately only one or two very poor specimens. Further work on better specimens since received has demonstrated clearly that these two genera, belonging to the subfamily *Eriocraniinae*, though they possess a frenulum as before stated, do *not* have the jugal lobe turned under the forewing; this lobe projects backwards above the costa of the hindwing, as Comstock has recently figured it. Thus there is a very distinct difference between the condition of the jugal lobe in the *Micropterygina*e and *Mnesarchaeinae* on the one hand, and that of the *Eriocraniinae* on the other. Considering also the differences in larval structure, it seems clear that we are really dealing with three distinct families, and that Meyrick's uniting of them all into one can only result in much confusion of ideas.—R. J. Tillyard, Hornsby, New South Wales, Australia.

A New Skipper from South America (Lepid., Hesperidae).

By A. W. Lindsey, Decatur, Illinois.

A specimen received from Colombia, South America, in the spring of 1918 has been placed as a new species of Mabille's genus *Haemactis*. Mabille concludes his description with the statement, "Tibias postérieurs nus à une paire d'éperons" (hind tibiae bare, with one pair of spurs), but the specimen at hand bears a short tuft of hair at the distal end of the hind tibiae and a long tuft at their proximal end. Its great similarity to *H. sanguinalis*, type of *Haemactis*, in other respects has led to its being placed with that species, for the secondary sexual characters alone seem insufficient for the establishment of a new genus.

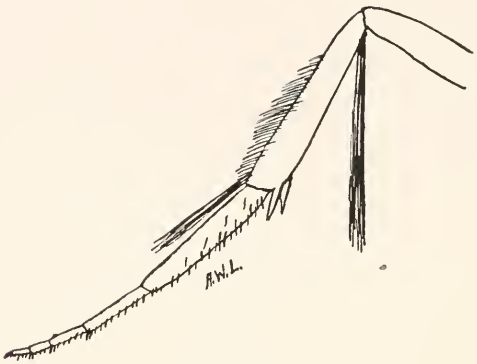
Haemactis pyrrhosphenus n. sp. (Text-fig.).

Upper surface of wings deep brown with the following bright scarlet marks: On the primaries a basal patch and a sub-basal cuneate band extend from the costa almost to the anal vein. These are followed, just before the end of the cell, by a similar pair of cuneate spots extending inward to the middle of the cell. All of these marks are cut by the brown ground color along the veins so that their cuneate shape is only approximate. The four subapical spots so common among the skippers are present, but are outwardly indistinct and merge through a powdery area with the terminal marks. Next to the cell they are ochreous. The outer margin has a rounded-cuneate mark of the same shade of scarlet in each interspace and two between Cu2 and A, which are somewhat longer than the rest. Fringes brown, paler than the ground color. Secondaries similar to primaries but lacking the costal marks. The terminal cuneate marks are about one-quarter as long as the wing and are inwardly more acute than those of the primaries.

Beneath, the primaries are fuscous brown with the inner margin paler and a short, whitish dash along the base of the cubital stem. Only the apical red mark, part of the middle costal patch, and the preapical spots are visible on this surface. The secondaries are fuscous brown between the costa and cell, thence gradually blending into the grayish-luteous inner margin. The veins are marked with the same shade as the costal portion and the outer margin is tinged with scarlet. Fringes of both wings fuscous.

The body is brown above, palpi brown, and head with a few red scales forming a thin transverse line behind the eyes and a small patch of white scales in front of each eye. Underneath the body and legs are concolorous with the wings and the palpi show a few white scales.

Attached to the inner surface of the hind tibia of the male at the proximal end is a slender tuft of long hairs which extends beyond the distal end of the tibia. Here, on the opposite side of the leg, is attached a tuft of shorter hairs which lies along the upper surface of



the metatarsus and does not quite reach its end. (See figure.)

Expanse of type 40 mm.

Type one male from Muzo, Colombia, South America, taken June, 1917, now in the collection of the writer.

Eumerus strigatus Again (Dip., Syrphidae).

By C. L. Metcalf, Ohio State University.

In an interesting article by Messrs. Weiss and Nicolay, "*Eumerus strigatus* Fall., the Lunate Onion Fly, in New Jersey" (Ent. News, xxx, p. 27, Jan., 1919), the authors call attention to the capture of an adult in a greenhouse in New Jersey and to its having been reared from roots and bulbs found in New York, Connecticut and Texas (B).*

The authors appear to be of the opinion that the fly is practically unknown in North America, for they say:

"Considering the fact that it was first noted in the United States in 1906 (Chittenden), it is strange that more records of it have not turned up."

A hurried survey of the literature reveals the following records; probably others have been overlooked:

*The letters refer to articles in the bibliography below.

(A) 1910, Dec., Johnson, Charles W., Some Additions to the Dipteran Fauna of New England, Psyche, xvii, 6, p. 230.

(B) 1912, Jan., Felt, Ephraim Porter, 27th Report of the State Entomologist, N. Y., 1911 (N. Y. State Ed. Dept., Bul. 510, 1912, pp. 119, 120.)

(C) 1915, April, Davidson, W. M., Occurrence of *Eumerus* (Syrphidae) in California, Can. Ent., xlvii, 4, pp. 134-135.

(D) 1916, June, Johnson, Charles W., Some New England Syrphidae, Psyche, xxiii, 3, p. 80.

(E) 1916, Oct., Davidson, W. M., Economic Syrphidae in California, Jour. Ec. Ent., Vol. 9, No. 5, p. 457.

(F) 1916, Oct., Metcalf, C. L., Syrphidae of Maine, Me. Agr. Exper. Sta. Bull. 253, p. 217.

(G) 1917, June, Gibson, Arthur, The Occurrence of *Eumerus strigatus* Fln. in Canada, Can. Ent., xlix, 6, pp. 190, 191.†

Felt (B) says: "There appears to be no published record of the insect having been found in America." W. M. Davidson (C) and Arthur Gibson (G) in articles in the *Canadian Entomologist,* both accredit the first record of the species from America to Felt (B). All of these authors appear to have overlooked the note by Mr. Charles W. Johnson in *Psyche* for December, 1910 (A), which antedates the record by Felt by more than a year, and which is, so far as I am aware, *the first published record* of *Eumerus* in America. The specimens noted by Johnson were taken in 1908 and 1909. Hence, the first *capture* of the species on the American continent may be that by Doctor Fletcher at Ottawa, in 1904, as reported by Gibson (G).

The chronological record for this species in North America, so far as reported, appears therefore to be as follows:

1904, August 19, Ottawa, Canada; adult, Doctor Fletcher. (First capture) (G).

1906, October, reared at Washington, D. C., from bulbs from Buffalo, N. Y., from Connecticut and from Brownsville, Texas; Doctor Chittenden (B).

1908, June 3, Buffalo, N. Y.; adult, M. C. Van Duzee (A).

† Since this article was submitted for publication, there have appeared in the Journal of Economic Entomology (Vol. 12, No. 2, April, 1919, p. 135) two short notes on the occurrence of these flies, by E. R. Sasscer and R. C. Osburn, which further extend the known distribution of *Eumerus strigatus* to Ohio, Philadelphia, Colorado and the State of Washington.

1909, June, Brookline, Mass.; adult, Charles W. Johnson (A).
1910, April, Victoria, B. C.; reared from Narcissus bulbs, E. A. Wallace (G).
1910, October, Victoria, B. C.; larvae abundant in greenhouse, C. G. Hewitt (G).
1910, December, first published record; Johnson, C. W. (A).
1911, August 19, Saratoga Springs, N. Y., reared from Iris roots, E. P. Felt (B).
1914, May to July, Walnut Creek, Berkeley and Oakland, California; ten specimens on the wing, W. M. Davidson (C).
1916, Melrose Highlands, Mass.; adult, R. T. Webber (D).
1916, San Francisco Bay region, Calif.; adults, W. M. Davidson (E).
1916, July 25, Bar Harbor, Mt. Desert Island, Maine; I took a number of adults on the wing in one of the large nurseries. They were flying about among low-growing ornamentals, feeding from the blossoms. The nurserymen had no record of damage by the larvae to their bulbs.
1917, February 5, Montreal, Quebec; adult in greenhouse, J. I. Beaulne (G).

To these records I can add the following:

1916, May 23, Eburne, B. C.; adult, R. S. Sherman.

In 1917 I received through the kindness of Mr. H. F. Dietz, of the Federal Horticultural Board, a number of larvae of this species which had been intercepted in Narcissus bulbs from Holland in November. The larvae pupated in the laboratory from February 12 to March 1, and adults emerged from February 28 to March 14. On this last date some of the specimens were still larvae.

The species is recorded to have two generations a year. Its host plants include onion, Iris, shallot, Narcissus, hyacinth, and Amaryllis. Its reported distribution in America ranges from Maine to California and from Texas to British Columbia, Ottawa and Quebec. I believe that this species, like its companion in habit, *Merodon equestris*, is thoroughly established in widely separated regions of this continent; that many other records of its occurrence at intermediate points will be forthcoming; and that it constitutes a real and totally unappreciated menace to the interests of horticulturists, florists and onion farmers. It will be very surprising if we do not have a sudden and severe outbreak of one or both of these pests, when they have become a little more thoroughly acclimated and have

experienced a period of conditions favorable to their rapid increase in numbers.

I note the following records of the occurrence of the latter species, known as the larger Narcissus- or Daffodil-fly, which are in addition to the records of its interception in shipments of bulbs from abroad.

(H) 1908, Jan., Osburn, R. C., British Columbia Syrphidae, New Species and Additions to the List, Can. Ent., xl, 1, p. 10. A number of specimens from several localities. Believes it established.

(I) 1911, Hewitt, C. G., Report of the Dominion Entomologist, Canada Expt. Farms Reports, 1911, pp. 207-235, pls. 3, figs. 3. A serious pest in British Columbia; some 50,000 Narcissus and Daffodil bulbs having been destroyed near Victoria during the year.

(J) 1911, Norman, P., Merodon equestris in southern British Columbia, Proc. Brit. Columbia Ent. Soc. n. ser. 1911, No. 1, pp. 22-26.

(K) 1914, Childs, L., The Large Narcissus-bulb Fly (Merodon equestris), Mo. Bul. Com. Hort. Cal., 3 (1914) No. 2, pp. 73-76, figs 2. Taken frequently in Sutter Co. and San Rafael, Calif.

(L) 1916, June, Johnson, Charles W., Some New England Syrphidae, Psyche, xxiii, 3, p. 79; Blue Hill, Mass., June 5, 1910, Great Barrington, June 16, 1915.

(M) 1916, Sept., Banks, Nathan, et al., District of Columbia Diptera: Syrphidae, Proc. Biol. Soc. Wash., xxix, p. 188; record a specimen labeled Aug. 4, 1907.

(N) 1916, Davidson, W. M., Economic Syrphidae in California, Jour. Ec. Ent., Vol. 9, p. 457.

(O) 1910, Oct., Metcalf, C. L., Syrphidae of Maine, Me. Agr. Exper. Sta. Bull. 253, p. 217.

This species was taken in company with *Eumerus* (vide supra) at Bar Harbor, Maine, July 25, 1916. The three specimens taken in the few minutes available for collection represent three of the many diverse color varieties. See in this connection also Johnson (L).

Norman (J) states that it is said to have been introduced to British Columbia about 1905, and that six months are passed in the larval stage, pupation occurring in the soil in February and the adults emerging in late March, and ovipositing in May. Childs (K) says the females oviposit throughout the greater part of the summer. Stocks,* however, states that the life-

cycle is of two years' duration, the larvae being destructive from July of one year to February of the second following year, spending about 19 months in the bulb. Childs (K) lists its host plants as follows: Narcissus, Amaryllis, Vallota, Habranthus, Eurycles, Galtonia, and the bulbs of the wild hyacinth, *Scilla nutoris*.

The control measures for these flies are given as follows by MacDougall† and Childs (K): Examine all bulbs to be planted, destroying all sickly, discolored and infested ones. The infestation can often be detected by pressing between thumb and fingers; if there is a distinct "giving," the bulb is probably infested. Bulbs may be at least partly freed of infestation by submerging for from two to eight days, then thoroughly drying. If an attack is noted in the field, the bulbs should be taken up and burned and the top soil deeply buried in September or early October. (Collinge: Manual of Injurious Insects.)

A new Amastus from Argentina (Lep., Arctiidae).

By W. Schaus, U. S. National Museum, Washington, D. C.

Amastus formosana sp. nov.

♂. Antennae brown. Head, collar and thorax dark steel grey; a small yellow spot on tegulae; a fine yellow streak outwardly on patagia. Palpi: first and second joints crimson fringed in front with dark steel grey, the third joint entirely steel grey. Thorax below dull red mottled with yellow brown; legs dark grey partly streaked with crimson at base. Abdomen above crimson, underneath dark grey, expanding laterally towards anal segment, where it meets dorsally.

Fore wings fuscous brown, the costal margin lighter brown the same shade as the antennae; markings light ochreous brown; antemedial elongated spots: one in cell small, one below cell larger with a similar spot above submedian and a narrow streak below submedian; a large spot at end of cell, its anterior edge curved and truncated close to median vein, its outer edge almost straight; postmedial spots large only separated by veins from vein 7 to submedian, below which there is only a minute streak; a series of small subterminal spots, partly lunular, the spot between veins 5 and 6 larger and coalescing with the postmedial spot.

Hind wings semihyaline yellowish white, tinged with roseate at anal angle; a narrow line on discocellular, hairs on inner margin, cilia and tips of veins fuscous brown. Expanse: 61 mm.

Habitat—El Saltadillo, Argentina. *Type* in the United States National Museum.

*Stocks, G., The Daffodil-fly, Merodon Equestris, in The Daffodil Year Book, London, 1914, Roy. Hort. Soc., pp. 50-59, pls. 2.

†Jour. Brd. Agr. (London) 16, (1909) No. 4, pp. 293-297, pls. 2, fig. 1 and ibid., 20, (1913) No. 7, pp. 594-599, figs. 2.

ENTOMOLOGICAL NEWS.

PHILADELPHIA, PA., JUNE, 1919.

A League of Nations Means the Metric System.

A few years ago we published an editorial in the NEWS endorsing efforts made in the House of Representatives to enforce the use of the Centigrade thermometric scale in United States Government publications. The strongest argument for such action was that the Centigrade scale was already in well nigh universal use.

The progressive World Trade Club of San Francisco is urging the United States and Great Britain (the only large nations not using the Meter-Liter-Gram system) to take advantage of the present opportunity in the world's history and legalize the exclusive use of the metric system of weights and measures. The same reason for this change exists as is the case in the matter of thermometry.

As entomologists we have been giving the size of insects in millimeters for many years, and when we go back to some old description and have to translate "lines," or some other antique unit, into modern equivalents, we feel a sinking of the heart. Let us, in these days of a League of Nations, internationalize our standards of measurement as well as our political relations. Let everyone urge his Congressmen to do their utmost to accomplish this result.

Stop Thief!

What is the mental attitude of the thief toward himself? Does the knowledge that he is a thief lower him in his own estimation? It is with sorrow and regret that we admit that there are thieves among entomologists. The individual who will steal from a museum where collections are kept for the benefit of all interested is of the mean kind of person who has no real love for the pursuit and is usually of the collector type who spends his life in sticking specimens over labels and ticking them off in a list and reminds one of many postage stamp collectors. It is almost impossible to give access to a collection and stand over each person every minute to prevent

a mean skunk from pilfering, or to go through the clothes of every person as he finishes studying a collection. Such a course would be offensive to the many visitors to a museum who come for legitimate study and comparison. Many insects are quite small and readily concealed and some weasel may quickly slip into a box the things he covets to fill out the blank spaces in his own collection. We can only repeat with shame that such degraded persons exist among those who are supposed to truly love nature and science for their own sakes. Theft is as far from the thoughts of the true naturalist as murder.—HENRY SKINNER.

Entomological Literature.

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded.

The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of papers containing new genera or species occurring north of Mexico are all grouped at the end of each Order of which they treat.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

4—Canadian Entomologist, London, Canada. **5**—Psyche, Cambridge, Mass. **7**—Annals of the Entomological Society of America, Columbus, Ohio. **8**—The Entomologist's Monthly Magazine, London. **9**—The Entomologist, London. **10**—Proceedings of the Entomological Society of Washington, D. C. **11**—Annals and Magazine of Natural History, London. **12**—Journal of Economic Entomology, Concord, N. H. **17**—Lepidoptera, Boston, Mass. **19**—Bulletin of the Brooklyn Entomological Society. **20**—Bulletin de la Societe Entomologique de France, Paris. **25**—Bulletino della Societa Entomologica Italiana, Firenze. **30**—Tijdschrift voor Entomologie, The Hague, Holland. **31**—Proceedings of the Entomological Society of Nova Scotia, Truro. **50**—Proceedings of the United States National Museum, Washington. **54**—Proceedings of the Biological Society of Washington, D. C. **59**—Journal of Agricultural Research, Washington, D. C. **64**—Parasitology, London. **68**—Science, Lancaster, Pa. **76**—Nature, London. **81**—The Journal of Parasitology, Urbana, Illinois. **82**—The Ohio Journal of Science, Columbus. **85**—The Journal of Experimental Zoology,

Philadelphia. **94**—The American Journal of Science, New Haven, Conn. **95**—Annales des Sciences Naturelles, Paris, Zoologie.

GENERAL. Baumberger, J. P.—Nutritional study of insects, with special reference to microorganisms and their substrata. **85,** xxviii, 1-81. **Bentley (G. M.)**—Benefits to be derived from observing, collecting and studying insects. (Tenn. Sta. Bd. Ent., Bul. No. 20.) **Crampton (G. C.)**—Remarks on the origin and significance of metamorphosis among insects. **19,** xiv, 33-40. **Fenton, C. L.**—Insect migration in Floyd and adjoining counties in Iowa. (American Midl. Nat., vi, 13-15.) **de Meijere, J. C. H.**—Zur evolution der zeichnung bei den holometabolen insekten. **30,** lxi, 57-75. **Onslow, H.**—Colour of the scales of iridescent insects in transmitted light. **76,** ciii, 84. **Riley, W. A.**—A use of galls by the Chippewa Indians. **12,** xii, 217-18. **Van Dyke, E. C.**—Distribution of insects in western N. Am. **7,** xii, 1-12.

MEDICAL. Parman, D. C.—Notes on Phlebotomus species attacking man. **12,** xii, 211-13. **Sweet, E. A.**—The transmission of disease by flies. (U. S. Pub. Health Service, Suppl. 29, Pub. Heal. Rep.)

ARACHNIDA AND MYRIAPODA. Nuttall, G. H. F.—The biology of Pediculus humanus. **64,** xi, 201-20.

Howard, C. W.—Preliminary report on the Trombidiidae of Minnesota. (Rep. Sta. Ent. Minn., xvii, 111-44.)

NEUROPTERA. de la Torre Bueno (J. R.)—Note on neuropteroids. **19,** xiv, 48.

Chapin (E. A.)—New species of N. A. Siphonaptera. **19,** xiv, 49-62.

ORTHOPTERA. Giglio-Tos, E.—Saggio di una nuova classificazione dei Mantidi. **25,** xlix, 50-87. **Morse (A. P.)**—List of the O. of New England. **5,** xxvi, 21-39.

HEMIPTERA. Gibson, E. H.—Hemiptera collected by the Yale Dominican expedition of 1913. **50,** lv, 275-7. Five n. sps. of Jassoidea from Honduras (Homoptera). **54,** xxxii, 25-28. **Morrison, H.**—Report on a collection of Coccidae from Argentina, with descriptions of apparently new sps. **10,** xxi, 63-91. **Oestlund, O. W.**—Contribution to knowledge of the tribes and higher groups of the family Aphididae. (Rep. Sta. Ent. Minnesota, xvii, 46-72.)

LEPIDOPTERA. Allen, E. C.—Key for determining the Crambinae of Nova Scotia. **31,** No. 4, 86-8. **Busck, A.**—On some generic synonymy in the family Gelechiidae. **10,** xxi, 94-6. **Ehrmann (G. A.)**—A new tropical American Papilio. **17,** iii, 30-1. **Herrick & Detwiler**—Notes on the repugnatorial glands of certain Notodontid

caterpillars **7,** xii, 44-8. **Knetzger (A.)**—A quick relaxing method. **17,** iii, 30. **Mabille & Boullet**—Essai de revision de la famille des Hesperides. **95,** ii, 199-258. **Raymundo, B.**—Noticia sobre alguns lepidopteros serigenos do Brasil. (Rio de Janeiro, 70 pp.) **Rothke (M.)**—Notes on Brephos infans. **17,** iii, 25-7. **Rummel (C.)**—Observations on Physiodes nycteis. Trapping for larvae of Apantesis. **19,** xiv, 47; 62-3. **Swinhoe, C.**—On the geographical distribution of the genus Cosmophila, a noctuid of the family Gonopteridae. **11,** iii, 309-14. **Van Escke (R.)**—Geschichtlich-anatomische untersuchung von den genitalorganen der L. **30,** lxi, 147-231. **Wormsbacher (H.)**—Useful hints to collectors. **17,** iii, 28-9.

DIPTERA. Aldrich, J. M.—The dipterous genus Imitomyia (Himantostoma). **4,** 1919, 64. **Bezzi, M.**—Rinvenimento di una Chionea nei dintorni di Torino [with bibliography]. **25,** xlix, 12-49. **Bishopp & Laake**—The dispersion of flies by flight. **12,** xii, 210-11. **Edwards, F. W.**—Note on the egg-bursting of eucephalous fly-larvae. **11,** iii, 372-76. **Enriques, P.**—Ricerche sulla eredita delle mosche (Rivista di Biologia, Roma, i, 72-81.) **Frost, S. W.**—Two sps. of Pegomyia mining the leaves of dock. **59,** xvi, 229-44. **Keilin (D.)**—On the alimentary canal and its appendages in the larvae of Scatopsidae and Bibionidae.... **8,** 1919, 92-6. Supplementary note on the formation of a cocoon by cyclorhaphous dipterous larvae. **64,** xi, 237-8. **McAtee & Walton**—District of Columbia D.: Tabanidae. **10,** xx, 188-206. **Parker (R. R.)**—Concerning the subspecies of Sarcophaga dux. **19,** xiv, 41-6. **Parker & Wells**—Observations on and experiments with Cuterebra tenebrosa. **81,** v, 100-4.

Malloch (J. R.)—A new Phorid from Illinois. **19,** xiv, 47-8.

COLEOPTERA. Gravely, F. H.—Contribution towards the revision of the Passalidae of the world. (Mem. Indian Mus., vii, No. 1.) **Mosher, E.**—Notes on the immature stages of Deltometopus rufipes. **7,** xii, 49-55. **Wickham, H. F.**—Fossil beetles from Vero, Florida. **94,** xlvii, 355-7.

Fall, H. C.—The Californian species of Malthodes. **7,** xii, 31-43. **Fisher, W. S.**—Descriptions of a new genus and species of Buprestidae from Arizona. **10,** xxi, 91-3. Five new sps. of Ptinid beetles. **50,** lv, 295-9.

HYMENOPTERA. Bradley, J. C.—The status of Parabates Foers., and Parabatus Thoms. (Ichneumonidae). **11,** iii, 319-24. **Burrell & Smith**—Key to the species of Wisconsin ants, with notes on their habits. **82,** xix, 279-92. **Cockerell, T. D. A.**—A new colletid bee from Ecuador. **10,** xx, 206-7. **Cushman & Rohwer**—Genus Ephialtes first proposed by Schrank. **10,** xx, 186-8. **Emery (C.)**—Sur le genre Tranopelta et sur le type du genre Cremasto-

gaster. **20,** 1919, 60-2. **Fraser, H. J.**—Few notes on ant history and habits. **31,** No. 4, 6-9. **Perkins (R. C. L.)**—Note on some genera of Nyssonidae. **9,** 1919, 76-7. **Robertson, C.**—Erroneous generic determination of bees. **68,** xlix, 422-3. **Rohwer & Fagan**—Additions and corrections to "The type species of the genera of the Cynipoidea...." **50,** lv, 237-40. **Washburn, F. L.**—Hymenoptera of Minnesota. (Rep. Sta. Ent. Minn., xvii, 145-237.)

Cockerell, T. D. A.—Some fossil parasitic H. **94,** xlvii, 376-80. **Gahan, A. B.**—New reared parasitic H. with some notes on synonymy. **50,** lv, 113-128. **Kinsey (A. C.)**—Fossil Cynipidae. **5,** xxvi, 44-9. **Wheeler (W. M.)**—A new subspecies of Aphaenogaster treatae. **5,** xxvi, 50.

Doings of Societies.

Entomological Section, Academy of Natural Sciences of Philadelphia.

Meeting of January 23, 1919. Five persons present, Director Philip Laurent presiding.

Mr. Robert Lee Haines, Moorestown, New Jersey, was proposed as a contributor and elected.

Orthoptera.—Mr. Rehn made a few remarks on the species of the Acridid genus *Chlocaltis*, showing, with the aid of a sketch map, the distribution of the three species, one of which is now being described by Mr. Hebard and himself. An interesting feature of the geographic size variation found in the genus was also discussed.

Lepidoptera.—Mr. Laurent exhibited a series of nine males of *Eurymus* (*Colias*) *philodice* Gdt. collected at Mt. Airy, Philadelphia, in which the specimens show considerable variation in the number and size of the spots in the submarginal space of the under side of the wings. No. 1 has seven large markings on each of the fore wings and six on each hind wing, while No. 9 is without markings on the fore wings and only three faint marks on each of the hind ones.—Geo. M. Greene, *Recorder.*

Feldman Collecting Social.

Meeting of March 19, 1919, at the residence of H. W. Wenzel, 5614 Stewart Street, Philadelphia. Nine members were present, President H. W. Wenzel in the chair.

Diptera.—Mr. Hornig said he had collected some mosquito eggs in South Philadelphia and the first to hatch were *Aëdes sylvestris* Theob. on March 15th; the next larvae to appear were *A. curriei* Coq. on March 17th. Also recorded the finding today of *Wyeomyia smithii* Coq. in pitcher plants at Brown's Mills, New Jersey. The live larvae of *sylvestris* and *smithii* were exhibited, as were the macerated frag-

ments of insects of several orders taken from one pitcher plant. Mr. H. W. Wenzel said he had found along the line of the old Lancaster Pike, Pennsylvania, on January 26th, an old chestnut log and after tearing off the outer bark had found in the fibrous part beneath two clusters of larvae about an inch in diameter, each containing forty or fifty larvae. These were placed in a jar and soon pupated. In the last two weeks many Diptera have emerged and he was surprised to note they are of several species and are as follows: *Tipula* sp.?, *Lonchaea polita* Say, *Pseudotephritis vau* Say, and a new species, *Stoptera digna,* being described by E. T. Cresson, Jr.

Lepidoptera.—Mr. Haimbach recorded two specimens, captured flying, of the "Codling moth," *Carpocapsa pomonella* Linn., on his place at Lower Merion Township, Montgomery County, Pennsylvania, February 16th.

Coleoptera.—Mr. Laurent showed a copy of "A preliminary list of the insects of the Province of Quebec. Part III, Coleoptera," by G. Chagnon, 1917, and stated that of the 1810 species listed somewhat over 1300 are in the New Jersey list.—Geo. M. Greene, *Secretary.*

OBITUARY

Eliza Klages was born opposite the present courthouse, Grant Street, Pittsburgh, Pennsylvania, January 14, 1835, and died in Crafton, in the same city, March 13, 1919. She was the third of seven children and the only daughter of Jacob and Elizabeth Poth (née Winter) who came from Germany in their early life, were married in Baltimore, and settled in Pittsburgh in 1828. On November 7, 1850, she married G. A. Klages, from which union eight sons and two daughters were born, of whom but half now survive. Of the sons attaining manhood, Charles (the oldest) became devoted to floriculture, and four others became interested in entomology. Frederick, the oldest of these four, did very creditable field work in Jamaica in 1884, and died in 1886 in his 28th year.

Although not listed among the entomologists, Eliza Klages was a lover of nature from her childhood and for many years manifested a lively interest in entomology, which she retained until her last illness. She was particularly informed on the Coleoptera and enjoyed the short collecting trips taken with the writer, whose collection is much the richer because of her interest and devotion.—Her son, Edward A. Klages.

FOR SALE The entire catch of insects in all orders except Coleoptera (also some families of Coleoptera) on a two months' collecting trip in New Mexico, California and Oregon.

Five weeks in a section which has not been collected. If interested write at once.

W. J. CHAMBERLIN, 33 Murray Street, New York, N. Y.

FOR SALE

Entomological News, Vols. 1 to 28, complete, unbound.
Price, $30.00 boxed F. O. B. Hyattsville.
Address W. R. WALTON, Hyattsville, Md.

THIS SPACE

FOR RENT.

NEW ARRIVALS

From Columbia, So. America:

OVER 10,000 BUTTERFLIES, INCLUDING

Morpho cypris
" sulkowskyi
Morpho amathonte
Caligo spp.

From Cuba:

1500 BUTTERFLIES AND MOTHS, INCLUDING

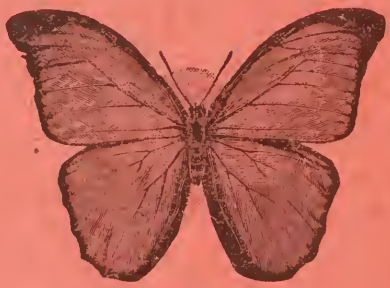
Papilio columbus
" andraemon
" celadon
" devilliersi
Urania boisduvali
Erinyis guttalaris
Protoparce brontes, etc.

From Venezuela:

Over 5000 Lepidoptera
200 Dynastes hercules

From New Guinea:

2000 Coleoptera
200 Orthoptera



From Assam, India:

1200 BUTTERFLIES AND MOTHS, INCLUDING

Papilio arcturus
" philoxenus
Kallima inachis
Brahmaea wallachi

And Many Other Showy Species

From Tibet (Bhutan)

Armandia lidderdalii
Parnassius hardwicki

CATALOGUES OF
ENTOMOLOGICAL SUPPLIES AND SPECIMENS
ON APPLICATION

If interested kindly send your list of desiderata for further information to

THE KNY-SCHEERER CORPORATION

epartment of Natural Science
G. Lagai, Ph.D.

New York
404-410 W. 27th Street

JULY, 1919.

ENTOMOLOGICAL NEWS

Vol. XXX. No. 7.

Thaddeus William Harris
1795-1856.

Smithsonian Institution
JUL 8 1919
National Museum

PHILIP P. CALVERT, Ph.D., Editor.
E. T. CRESSON, Jr., Associate Editor.

HENRY SKINNER, M.D., Sc.D., Editor Emeritus.

Advisory Committee:

EZRA T. CRESSON, PHILIP LAURENT, GEORGE M. GREENE, J. A. G. REHN, H. W. WENZEL.

PHILADELPHIA:
The Academy of Natural Sciences,
LOGAN SQUARE.

Entered at the Philadelphia Post-Office as Second-Class Matter.
Acceptance for mailing at the special rate of postage provided in Section 1103,
Act of October 3, 1917, authorized on July 19, 1918.

ENTOMOLOGICAL NEWS

published monthly, **excepting August and September,** in charge of the Entomological Section of The Academy of Natural Sciences, Philadelphia, and The American Entomological Society.

ANNUAL SUBSCRIPTION, $2.00 IN ADVANCE.

SINGLE COPIES 24 CENTS.

ADVERTISING RATES: Full width of page. Payments in advance.

One issue, one inch,	$ 1.20,	two inches, $ 2.40,	half page, $ 4.00,	full page, $ 8.00
Five issues, "	5.50, "	11.00, "	17.50, "	35.00
Ten issues "	11.00, "	20.00, "	35.00, "	70.00

☞All remittances, and communications regarding subscriptions, non-receipt of the NEWS or of reprints, and requests for sample copies, should be addressed to ENTOMOLOGICAL NEWS, 1900 Race Street, Philadelphia, Pa. *All Checks and Money Orders to be made payable to the* ENTOMOLOGICAL NEWS.

☞All complaints regarding non-receipt of issues of the NEWS should be presented within three months from date of mailing of the issue. After that time the numbers will be furnished only at the regular rate for single copies.

☞Not more than two issues will be replaced gratis through loss, in transit or in change of address, unless such have been registered, at the subscriber's expense.

☞Address all other communications to the editor, Dr. P. P. Calvert, Zoological Laboratory, University of Pennsylvania, Philadelphia, Pa., from September 15th to June 15th, or at the Academy of Natural Sciences, from June 15th to September 15th.

TO CONTRIBUTORS.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" for each number into the hands of the printer five weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form and without covers, will be given free, when they are wanted; if more than twenty-five copies are desired, this should be stated on the MS. The receipt of all papers will be acknowledged. Proof will be sent to authors for correction only when specially requested.

SPECIAL NOTICE TO AUTHORS

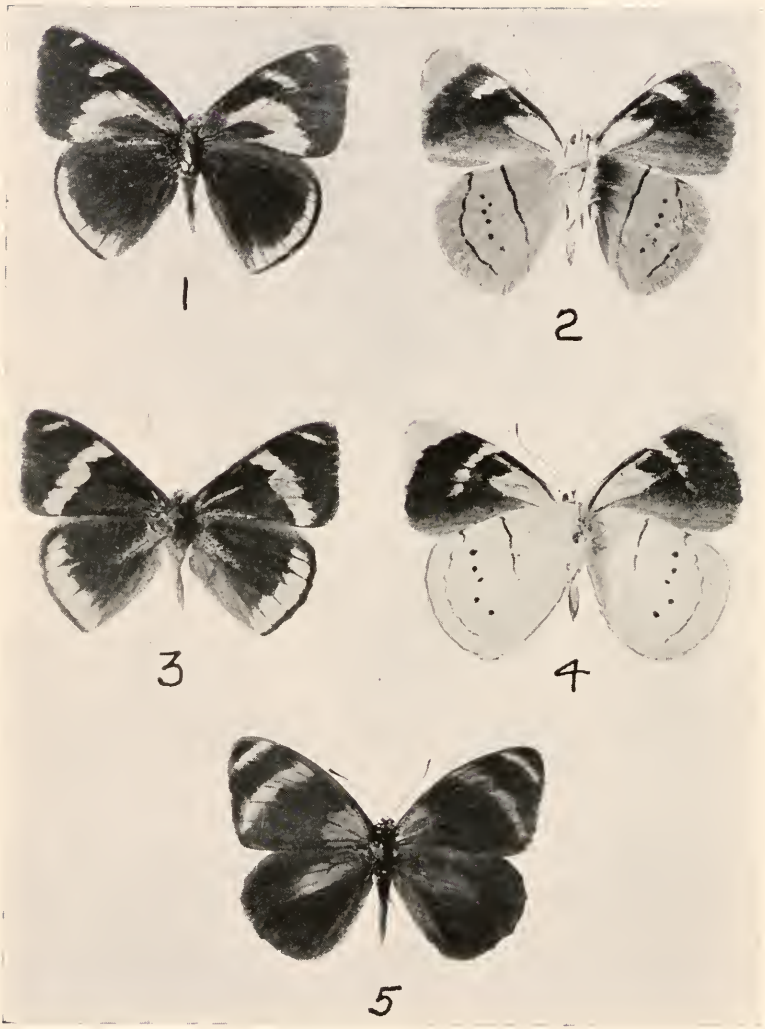
Owing to increased cost of labor and materials, no illustrations will be published in the NEWS during 1919, except where authors furnish the necessary blocks, or pay in advance the cost of making blocks, and pay for the cost of printing plates. Information as to the cost will be furnished in each case on application to the Editor. Blocks furnished or paid for by authors will, of course, be returned to authors, after publication, if desired.

☞ The printer of the NEWS will furnish reprints of articles over and above the twenty-five given free at the following rates: Each printed page or fraction thereof, twenty-five copies, 15 cents; each half tone plate, twenty-five copies, 20 cents; each plate of line cuts, twenty-five copies, 15 cents; greater numbers of copies will be at the corresponding multiples of these rates.

500 PIN-LABELS, 25 CENTS! All Alike on a Strip.

Smallest Type. Pure White Ledger Paper. Not Over 4 Lines or 30 Characters (13 to a Line). Additional characters 1c. each, per Line, per 500, Trimmed.

C. V. BLACKBURN, 12 Pine St., STONEHAM, MASS., U. S. A.



NEW AND RECENTLY DESCRIBED LEPIDOPTERA.—MENGEL

1, 2, *Perisama inconspicua*; 3, 4, *P. sinerubra*; 5, *Catagramma horstii*.

Smithsonian Institution
JUL
National Museum

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

THE ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XXX. JULY, 1919. No. 7.

CONTENTS:

Mengel—A new Perisama from South America (Lepid., Rhop.)..... 181
McAtee—Preliminary Key to the Nearctic Species of Eupteryx (Homoptera; Euptervgidae)..... 182
VanDyke—New Species of Buprestidae (Col.) from the Western United States, with Supplementary notes concerning others 186
Mitchell—Notes on Diacrisia virginica (Lep.)..... 191
Baker—A Melaphis from Moss (Hom.) 194
Schwarz—The early Stages of Catocala minuta and a Description of a New Variety of C. obscura (Lepid.) ... 196
Mickel—A new Genus of Cerambycidae from Wyoming (Col.)..... 198
Parker—North American Sarcophagidae; New Species of the Genus Sarcofahrtia R. Parker (Dip.)..... 201
Editorial—International Relations of Entomological Societies after the War..... 204
Entomological Literature 206
Review—Lochhead's Class Book of Economic Entomology..... 209
Obituary—William Francis de Vismes Kane, Sydney Webb, Grand Duke Nicolas Michailovitch, Raphael Blanchard, Jules Kunkel 'd Herculais, Herbert Huntington Smith, R. Kobert..... 209

A new Perisama from South America (Lepid., Rhop.).

By LEVI W. MENGEL, Reading, Pennsylvania.

(Plate VIII.)

Perisama sinerubra n. sp.

Expanse 43-45 mm. Upper side—primaries black with broad diagonal blue-green bar from middle of costal margin to the exterior angle. There is a small dash of blue-green near the apex. A few bars of the same color radiate from the base.

The inferiors are black with a bluish reflection toward the base. There is a broad marginal band of the same blue-green color. Fringes of wings white.

Under side—primaries largely black with a white spot in centre of the costa changing to blue and extending halfway across the wing, toward the exterior angle. Base of wing gray, changing to blue. Apex of wing light gray, with a faint black band dividing the gray color almost equally.

Under sides of inferiors without red costal and basal bar. Uniform gray in color. A thin black bar extends from the costal margin toward the inner angle. A black marginal band, comparatively regular, extends parallel along the exterior margin.. There is an irregular row of 5 black spots in the wing between the bars.

Sinerubra is nearest to *P. cotyora* Hew., from which it is very different.

Described from 7 specimens from Cavinas, Bolivia. *Type*—The Academy of Natural Sciences of Philadelphia. Paratypes—Collection Mengel.

EXPLANATION OF PLATE VIII.

Figs. 1-2, *Perisama inconspicua* Mengel, Bolivia. (Ent. News, xxvii, p. 423, 1916).

Figs. 3-4, *Perisama sinerubra* Mengel, Bolivia, n. sp.

Fig. 5, *Catagramma horstii* Mengel, U. S. Colombia. (Ent. News, xxvii, p. 423, 1916).

Preliminary Key to the Nearctic Species of Eupteryx (Homoptera; Eupterygidae).

By W. L. McATEE, Biological Survey, Washington, D. C.

For bibliographic references and history of the genus *Eupteryx* Curtis, see article by the writer on Genera of the Eupterygidae, Proceedings of the Biological Society of Washington, Vol. 31, pp. 109-124, Nov. 29, 1918.

Diagnostic characters in this family: Membrane without appendix; hindwing without submarginal vein, and with three apical cells.

After determining that forewing lacks appendix, the easiest method of recognizing *Eupteryx* is to lift outer apical part of forewing; if the hindwing then exposed has no submarginal vein and the first two sectors are joined by a crossvein, the insect is a *Eupteryx*.

Key to the Species.

A. Fourth apical cell of forewing distinctly 5-sided (in other words, the second sector forms part of the outer border of the cell); three black spots on vertex, three pairs of irregularly oval, brownish, ocellate spots on disc of forewings.....*melissae* Curtis.

AA. Fourth apical cell of forewing 4-sided (second sector does not form part of its outer border, no more than tangent to it, and sometimes separated by a short stalk); coloration otherwise.

B. Forewings white; vertex, thorax and scutellum mostly black. *vanduzei* Gillette.

BB. Forewings not white; general color above smoky to blackish, sometimes varied with yellow or sanguineous, *flavoscuta* Gillette.

Eupteryx melissae Curtis.

Eupteryx melissae Curtis, John. British Entomology being Illustrations and Descriptions of the Genera of Insects found in Great Britain and Ireland, Vol. 14, No. 640 [p. 2], April, 1837 [Niton].

A group of nominal European species which are very closely related includes *urticae* Fabricius, *melissae* Curtis, *stachydearum* Hardy and *collina* Flor. Characters adequate for distinguishing these species have not as yet been pointed out. Of the four names *urticae* is the oldest (Fabricius, 1803), and in case all are synonymous, has priority. However, *urticae* by one character—half of hind tibiae being black—is contrasted with the other three, and may be varietally if not specifically distinct. The next oldest name—*melissae* Curtis—is, therefore, here adopted. Its synonymy appears to include:

Typhlocyba stachydearum Hardy, James. Descriptions of some new British Homopterous Insects. Transactions of the Tyneside Naturalists' Field Club, 1, 1846-50 (1850), pp. 422-3 [Axwell Park].

Typhlocyba collina Flor, Gustav. Die Rhynchoten Livlands in systematischer Folge beschrieben. 2, 1861, pp. 433-5 [Kudling, Segewold, Kremon].

Eupteryx quinquemaculata, Baker, C. F. New Typhlocybini. Invertebrata Pacifica, Vol. 1, p. 8, Sept. 15, 1903 [Stanford University, California].

Head evenly and fully rounded both laterally and vertically. Length of vertex: interocular width:: 6:10. General color of upper surface of body and of the legs pale yellow; of forewings delicate green fading toward apex; eyes yellowish green. Head with 2 smaller spots on front, 2 larger on transition from front to vertex, and one of about same size on middle of hind margin, black. All of these spots vary from round to V-shaped or quadrangular; hence do not have the importance in distinguishing species assigned to them by European authors. Pronotum with two black spots, just behind median spot on vertex, and one lying just behind and to the side of each of these. Most of disc of pronotum covered by a greenish fuscous cloud, nearly touching the black spots. A dimly visible brown line connects the black spots, and, being a little more conspicuous at the ends, forms a curved brown dash, to the outer side of each of the posterior pair of dots. Scutellum with two pairs of black dots, the anterior larger and more separated.

Forewings with irregular greenish fuscous markings, the color deepest at periphery (like blots the center of which has been sucked up), as follows: One larger and a few smaller on inner anterior angle of

forewing, three larger (the median decidedly so) on main body of clavus and a long narrow one along whole claval suture; between second and third sectors, three, of which the anterior is largest; and one just outside latter on costa. The veins of the apical cells are margined with brown clouds and there are two black spots near exterior border of wing at a point two-thirds of the distance from base.

Long triangular mark on cheeks below insertion of antennae, lower surface of thorax and entire abdomen black, the segments of latter margined posteriorly (sometimes very broadly) with yellow. Last ventral segment yellow, genitalia chiefly yellow in male, mostly black in female. Tarsi and apex of beak black. Length 3-3.25 mm.

Specimens examined: North East, Pennsylvania, Oct. 10, 1912, F. Johnson (U. S. N. M.). Hagerstown, Maryland (U. S. N. M.).

Eupteryx vanduzei Gillette.

Eupteryx vanduzei Gillette, C. P. American Leaf-hoppers of the sub-family Typhlocybinae. Proc. U. S. Nat. Mus. 20, No. 1138, April 20, 1898, pp. 748-9, Figs. 98-100 [Hamburg, New York].

Scutellum and anterior parts black or blackish shading into pale yellow on anterior margin of vertex and upper part of face; lower part of face smoky. Legs, except tarsal claws, and abdomen pale yellow. Both pairs of wings milky white; apical cells of forewings fumose. Length of vertex: interocular width:: 7:13. Length of insect 3.5 mm.

One specimen only, the female type, New York. Type No. 3439, U. S. Nat. Mus.

Prof. Gillette states that this and six other specimens (of the same sex) used by him in original description were collected by E. P. Van Duzee at Hamburg, New York, July 10.

Variations mentioned by Gillette are whitish markings on posterior margin and angles of pronotum, and on apex of scutellum, and dark coloration of tarsal apices and of basal segments of abdominal tergum.

Eupteryx flavoscuta Gillette.

Eupteryx flavoscuta Gillette. Proc. U. S. Nat. Mus. 20, No. 1138, April 20, 1898, pp. 749-50 [Hamburg, New York].

Eupteryx nigra Osborn, Herbert. Jassidae of New York State. 20th Rep. State Entomologist, 1904, in 58th Ann. Rep. N. Y. State Museum, 1904, Vol. 5, Appendix 7, 1906, pp. 543-4 [Jamaica, New York; Columbus, Ohio].

The original account of this species states that the type locality is Hamburg, New York, and that the type is in the U. S. National Museum, No. 3440. There is no specimen in the Museum from Hamburg, N. Y., and that bearing No. 3440 is from Washington, D. C., June 23, 1890. If this is really part of the original material, it is only a paratype; the whereabouts of the holotype is unknown to the writer.

Key to Color Varieties.

A. Thorax with a median and 2 marginal sanguineous vittae, var. *juvenis* n. var.

AA. Thorax without sanguineous vittae.

B. Scutellum with broad median yellow vitta.

C. Costa broadly and clavus chiefly yellow...var. *clavalis* n. var.

CC. Costa less broadly yellow; clavus with only a faint spot, var. *flavoscuta* Gillette.

BB. Scutellum without yellow vitta.....var. *nigra* Osborn.

Eupteryx flavoscuta var **flavoscuta** Gillette.

For convenience, description of the typical variety is given first and with it are included the few details of color and proportion that, so far, seem to have specific value.

Smoky brown to blackish above, except anterior margin of vertex, an indistinct spot on clavus, and broad median vitta on scutellum pale yellow. The costal margin of the forewing, except sometimes at middle, is more or less broadly yellow, sometimes overlaid with pruinosity, apex of wing fumose hyaline, clear near margin, first, second and third apical cells with clear spots, that in first the largest. Face, legs and underparts pale yellow, abdominal segments and genitalia more or less margined with brownish. Length of vertex: interorbital width:: 1:2. Length of insect 3.3 mm.

Specimens examined: Greensburg, Pennsylvania, July 24, 1904, M. Wirtner; also same locality, no date (U. S. N. M.).

Eupteryx flavoscuta var. **clavalis** new variety.

Unusually wide vittae on scutellum and costal margin and almost whole clavus pale yellow.

Specimen from Uhler Collection, labeled only Sept. 23. Type (U. S. N. M.).

Eupteryx flavoscuta var **nigra** Osborn.

Scutellum concolorous with general dorsal surface.

Specimens examined: Columbus, Ohio, Sept. 15, 1903. [Paratype kindly loaned by H. Osborn and now in his collec-

tion.] Penn. Sta., Pennsylvania, Sept. 4, 18, 1904, M. Wirtner. [U. S. N. M.]. Patton, Pennsylvania, Sept. 25, 1902, M. Wirtner. [U. S. N. M.]. Orono, Maine, Aug. 31, 1913 [H. Osborn]. Bar Harbor, Maine, Aug. 31, 1913 [H. Osborn]. Washington, D. C., June 23, 1890 [U. S. N. M.]. Difficult Run, Virginia, July 25, 1915, C. P. Alexander [W. L. M.]. Specimens from Uhler Collection, labeled only Sept. 23 [U. S. N. M.].

Eupteryx flavoscuta var **juvenis** new variety.

General color decidedly lighter than in the other varieties, being grayish smoky; vertex with two sanguineous vittae closely bordering median line; thorax with narrow median vitta and sides behind eyes also sanguineous.

The specimens examined, from Orono and Bar Harbor, Maine, Aug. 31, 1913, kindly loaned by Prof. Herbert Osborn, in whose collection they are, are more or less teneral, leaving the question of fully matured appearance and perhaps of the varietal status of the form in doubt. The type is a male from Bar Harbor.

New Species of Buprestidae (Col.) from the Western United States, with Supplementary notes concerning others.

By Edwin C. Van Dyke, University of California, Berkeley, California.

(Continued from page 156)

Acmaeodera squamosa n. sp.

Form short, cylindrical, hardly depressed, piceous bronzed, clothed on both upper and under surfaces, except the apical ventral of females, with minute white scales which, under high power magnification, are shown to be tuft-like, each elytron with two rows of small elongate reddish yellow spots, the first row on the third interval and the second on the ninth or humeral interval, the discal spots being placed, the first at about the middle, the second midway between that and apex and overlapping laterally on to the fourth and fifth intervals, and the third about equidistant between this last and apex, the lateral spots with the first just posterior to umbone, the second near the middle, and the third and fourth following closely behind. Head coarsely, shallowly and closely punctate, with squamules arising from each puncture,

front feebly impressed, no carina, clypeus deeply semicircularly emarginate, antennae with fifth joint suddenly dilated; thorax unicolored, nearly twice as wide as long, apex narrower than base and bisinuate with median lobe projecting forward over head, the base truncate, the sides rather strongly arcuate from base to apex, margin fine, not visible from above, disc convex, coarsely and closely punctate and with squamules as on head, the median longitudinal impression well-defined, lateral foveae at base within posterior angles.

Elytra almost four times length of prothorax, umbone well developed, sides sinuate before middle, margin serrate posteriorly, disc convex, striae with deeply impressed large round and approximate punctures, intervals somewhat convex, the alternate more prominent, with double but irregularly placed rows of punctures, the squamules arising from all punctures.

Body beneath of a brilliant purplish coppery color and densely squamulose, coarsely closely punctate in front, much finer posteriorly, the apical segments in the female also quite granulose and furnished with rather long semi-erect silken hair which curves toward the front, the anterior margin of prosternum slightly sinuate, the fifth ventral without any trace of subapical carina. Length 7.5 mm., breadth 3 mm.

This species is most closely related to *A. guttifera* Lec. and is no doubt congeneric but is now most decidedly distinct. It differs from *guttifera* in being more robust, by having the prothorax more grossly punctate, the elytral intervals not flat but somewhat convex, especially the alternate ones, and with a double series of punctures, by having the prosternum of a slightly different type, and by having a dense squamose vestiture instead of a sparse hairy one. This vestiture covers the entire under surface in the male and all but the apices in the female, these last segments in this sex having the long silky hair as in *guttifera*. This is the species listed by Fall[5] as a variety of *guttifera*. I have a number of typical *guttifera* in my collection, also several *A. versuta* Horn, now considered to be the males of the preceding, and have seen numbers of others. They all agree in the essentials of sculpture and vestiture and stand well apart from their Arizona relative. Their different areas of distribution also argue in favor of their being different species. In the genus *Acmaeodera* the typical Arizona species are most decidedly different from the species

[5] Fall, H. C., Jour. N. Y. Ent. Soc., Vol. vii (1899), p. 21.

found in California outside of the more desert regions of the Southeast. The specimen mentioned by Fall, from Texas, having an intermediate type of vestiture, is either a variety of the Arizona species, or a species distinct from either this or *guttifera*. It cannot be a connecting form, seeing that it is not from intermediate territory but from a region at the extreme end of the distribution of one of the species.

Type and paratype, both females, collected at Florence, Arizona, by C. R. Biederman, in the collection of the American Entomological Society at the Academy of Natural Sciences of Philadelphia. Nine other specimens from the National Museum collection I have also critically examined. Two of these were collected at Catalina Springs, Arizona, April 26 and May 5, by Hubbard and Schwarz, one on *Jatropha multifida,* the other seven at Hot Springs, Arizona, in June, by Barber and Schwarz. One of these was reared from "Palo verde." These nine specimens all have the two anterior discal elytral spots three intervals broad and have five instead of four lateral spots, the additional spot being placed subapically. Four of the Hot Springs specimens I have designated as paratypes, a male and female which will remain in my own collection, and a male and female which will be returned with the five others to the U. S. National Museum. For the privilege of studying the two Florence specimens I am indebted to Dr. Henry Skinner and Mr. E. T. Cresson, Jr., and for the others to Dr. E. A. Schwarz and Mr. H. S. Barber.

Acmaeodera quadrivittata Horn.

This species is not as constant in marking as Dr. George Horn supposed. The specimens from Southern Arizona generally have but one yellow stripe, the lateral one disappearing in certain cases or coalescing with the discal stripe in others. In the latter case the stripes are of course broad and they also often have one or two black spots. These specimens are also generally larger and more robust than typical specimens.

Acmaeodera pubiventris Horn. (Plate VII, figs. 8, 9).

A series of specimens of this species which were collected at Mojave, California, and which were kindly given to me by the collector, Mr. C. L. Fox, have furnished me with the proof

that *A. lanata* Horn and *A. pubiventris* Horn are but phases of one species. *A. lanata* Horn is but a vittate form of the other, as Mr. Fall surmised. *A. biedermanii* Skinner, I find, after having carefully examined the type, is almost an absolute synonym of *A. lanata* Horn. My series shows that the species varies from the typical phase to the vittate phase, var. *lanata* Horn, on one side and, on the other, to a phase having the markings numerous, small and irregular. The vittate phase may be found in the same territory with the others, but usually is not. In this connection I wish to state that several of our species which have unstable color patterns have the same type of variability, possessing a vittate type of maculation as one extreme and a nebulous as the other. Besides the species just discussed, this condition is found in *A. acuta* Lec. and *A. gemina* Horn and approached in *A. hepburni* Lec. and *A. neglecta* Fall.

Acmaeodera plagiaticauda Horn.

As more specimens of this very fine species have been collected we find that it too is very variable. In certain specimens like those from the more desert regions, such as Bishop, California, the lateral fascia of the elytra may have its extreme yellow instead of being all red. In others the discal markings may be entirely eliminated, leaving but three or four marginal spots. In a couple of specimens from the Sierra Madre Mountains, near San Gabriel, the anterior of the three lateral spots was yellow, the other two the normal red. Those specimens which have all of the spots red, narrow and lateral, like certain ones recently secured by Dr. F. E. Blaisdell near Hullville, Lake County, California, look superficially very much like the rare *A. postica* Fall. This last can, however, be separated by having a different type of prosternal margin, by being of a coppery bronze color in contrast to the purplish bronze of the other, and by having the punctures of the elytral striae and intervals of about equal prominence with the striae themselves, poorly developed, whereas in the other the striae and strial punctures are prominent and interval punctures weak. *A. plagiaticauda* Horn has in most cases been beaten from the manzanita, *Arctostaphylos,* and no doubt breeds in this.

Acmaeodera cubaecola Duv. (Plate VII, fig. 6).

This species, as was pointed out by Kerremans in his monograph, is the one that we have for some time been calling *A. pulcherrima* Duv. Mr. Fall in his synopsis had unfortunately accepted the rather hasty determination of Mr. Linell. Mr. Mutchler, of the American Museum of Natural History, who called my attention to the above correction, likewise showed me a Cuban specimen of the true *A. pulcherrima* Duv. which is a very much larger species and quite differently marked, as can be seen by referring to the splendid illustration given in Kerremans' Monograph. The original description of Duval tallies exactly. *A. pulcherrima* Duv. has, so far as I now, never been taken in this country, but the beautiful orange-spotted *A. cubaecola* Duv. has not only been captured in Cuba but on a number of the Florida keys, as Key Largo, Key West and Metacombe Key. The species that we have erroneously listed as *A. cubaecola* Duv. is *A. marginenotata* Chev.[6] It is a Cuban species, but it has also been taken on Key Largo and Metacombe Key, Florida. See Plate VII, fig. 7.

Acmaeodera cribricollis Horn.

I have a typical specimen of this rare species in my collection, taken in the Imperial Valley, California, and have seen, besides, the type from Texas, one other from Southern Arizona. It is thus proven to be a species which has quite an extensive range along our Mexican border.

EXPLANATION OF PLATE VII.

Figures of the right elytra of *Acmaeodera* (enlarged):

No. 1. *Acmaeodera sinuata* n. sp. typical.
No. 2. *Acmaeodera sinuata* n. sp. variety.
No. 3. *Acmaeodera sinuata* var. *sex-notata* n. subsp.
No. 4. *Acmaeodera wenzeli* n. sp.
No. 5. *Acmaeodera wheeleri* n. sp.
No. 6. *Acmaeodera cubaecola* Duv.
No. 7. *Acmaeodera marginenotata* Chev.
No. 8. *Acmaeodera pubiventris* Horn.
No. 9. *Acmaeodera pubiventris* var. *lanata* Horn.

[6] "Coleopteres de i'Ile de Cuba.—Famille de Buprestides, Throscides, Eucnemides et Elaterides," par M. Aug. Chevrolat, Anns. Ent. Soc. Fr., Vol. vii (1867), p. 583.

Notes on Diacrisia virginica (Lep.).

By J. D. MITCHELL, U. S. Bureau of Entomology.

In July, 1917, larvae of *Diacrisia virginica* were observed all over Victoria County, Texas, in limited numbers, feeding on various species of weeds. At Placido they attacked three fields of cotton and, on about one acre in each field, defoliated the cotton, leaving the green bolls on the stalks. They spun cocoons in August. Owing to the extreme drought and the arrival of the cotton leaf worm, *Alabama argillacea, Diacrisia virginica* was lost sight of, and its work during the fall was unnoticed.

In May, 1918, severe infestations appeared in Victoria and adjoining counties, and many complaints came in of cotton being damaged. The writer spent some time in observations in Victoria and Calhoun Counties.

The larvae were found feeding on the following plants and shrubs:

Cardiospermum halicacabum	"Balfour vine"
Lupinus subcarnosus	"Blue bonnet"
Cassia occidentalis	"Punk weed"
Cassia chamaecrista	"Partridge pea"
Crotalaria sagittalis	"Rattle weed"
Helianthus multiflora	"Common sunflower"
Helianthus argophyllus	"Satin sunflower"
Helianthus angustifolius	"Prairie sunflower"
Tagetes sp.*	"Marigold"
Convolvulus (two species)	"Bird weed;" "Morning glory"
Lippia nodiflora	"Fog fruit"
Amaranthus retroflexus	"Careless weed"
Amaranthus albus	"Careless weed"
Amaranthus spinosus	"Careless weed"
Amaranthus hybridus	"Careless weed"
Croton capitatus	"Large leaf sage"
Croton texensis	"Narrow leaf sage"
Salvia species	"Wild sage;" "Bush sage"
Iva ciliata	"Marsh elder"
Ambrosia trifida	"Blood weed"
Ambrosia elator	"Rag weed"
Ludivigia natans	"Water purslane"
Parthenium hysterophorus	"Road weed"
Euphorbia sp.	Tall prairie "Milk weed"

Asclepias sp.	Small "Milk weed"
Solanum rostratum	"Horse nettle"
Amphiachyris dracunculoides	"Broom weed"
Monarda punctata	"Horse mint"
Verbesina helianthoides	"Crownbread"
Xanthium strumarium	"Cockle bur"
Chenopodium botrys	"Jerusalem oak"
Chenopodium album	"Lamb's quarter"
Phytolacca decandra	"Poke root"
Eupatorium alternifolium	"Ditch weed"
Xanthoxylum clava-herculis	"Prickly ash"
Acacia farnesiana	"Huisache"

They were found feeding on the following cultivated crops:

Gossypium hirsutum	Cotton
Zea Mays (only the silk is eaten)	Corn
Cucumis melo	Cantaloupe
Medicago sativa	Alfalfa
Arachis hypogoea	Peanut

They eat all garden truck.

The first infestation appeared on weeds in pastures and on the roadsides. Where the weeds were plentiful they did no damage to crops, but where weeds were scarce the caterpillars invaded the fields, especially cotton fields.

When very young, three pounds of Paris green and five pounds of lime, made into fifty gallons of spray, will kill the caterpillars; but where they are large, no poisons or repellants seem to have any effect on them.

Some farmers claim to have kept caterpillars out of their fields, until a fair yield was assured, by dusting ahead of them with pure Paris green. When the caterpillars reached the poisoned plants they turned back. Other farmers claimed to have saved a paying crop by going along the infested side and hand-picking and killing the caterpillars. This was practicable up to August and no doubt did some good. The caterpillars do not feed fast and do not all travel in the same direction as most army worms do.

Up to October all of the caterpillars were of the light yellow variety, occasionally a mature specimen approaching a light brown. After October 10 all caterpillars were black.

* This is possibly *Boebera papposa* (*Tagetes*).

From May until October 15 there were five fairly well marked generations, although from August on to the end of the season all sizes from very young to mature caterpillars could be found.

About November 1 I first observed dead caterpillars on weed stems. The living caterpillars would clasp the weed, usually as high as they could climb, and die, then swell up and exude a substance which clung to the hairs, giving the dead caterpillars a gray appearance. They would dry and remain clinging to the weed stems until knocked off. On November 5 I counted 701 caterpillars in three different directions from the town of Victoria, 662 dead and 39 still alive.

Between October 26 and November 10 I put 100 mature caterpillars in cages in groups, to carry them through the winter. I have three cocoons from the lot. The balance died of this disease, which has been determined by Doctor Speare as *Entomophthora anticae* Reich.

The caterpillars spin cocoons under trash, dead leaves or clods of earth, frequently in a bunch of twenty to thirty attached to each other.

When the moths emerge they climb up the weed stems to stretch and dry their wings. They usually emerge in the night and I have observed them mating in cages the next day and laying their eggs during the second night and third day. The moths are averse to flying in the daytime and when disturbed stretch their wings straight up, curve the abdomen downward and remain rigid; occasionally one, when thrown high in the air, will use its wings in coming back to the earth, but usually they fall to the earth without an effort to fly. I believe the males fly at night when seeking a mate. I have never observed a moth feeding in the field and I have never had one to feed in captivity, although I have tried them with flowers, fruits and sweets. The usual length of life of captive moths is about five days.

Reports from Jackson and Calhoun Counties indicate that all of the last generation caterpillars are black, and practically all of the caterpillars are dying clinging to the weed stems.

The damage to cotton by *Diacrisia virginica* in Victoria and Calhoun Counties in 1918 is claimed by farmers to be from twenty-five per cent. to total destruction. I visited the land of Mr. Jay Hubbard in Calhoun County, and found the destruction of cotton on sixty-five acres to be complete. The fields of Mr. Hubbard as well as the lands adjoining were free of weeds.

The only parasite bred from this species is *Eremotylus arctiae* Ashmead, which has been determined by R. A. Cushman.

A Melaphis from Moss (Hom.)

By A. C. Baker, U. S. Bureau of Entomology, Washington, D. C.

Only one American species has been recorded in the genus *Melaphis*. This is the type species, *Melaphis rhois* (Fitch), a form which produces galls on the sumach. Certain closely related species, occurring in other countries and like *rhois* forming galls on sumach have been referred to the genus *Schlechtendalia*. This genus the writer (Ent. News, Vol. xxviii, p. 385) has placed as a synonym of *Melaphis*. All of the species referable to *Melaphis*, therefore, form galls upon some species of sumach. It is noteworthy that these are fall galls, not spring ones like most of the common galls produced on poplar, etc., by species of *Pemphigus* and other aphids. The spring generations of our *Melaphis rhois* have not been discovered.

On April 29, 1916, Mr. E. B. Blakeslee sent the writer samples of moss which he found infested with an aphid at Springfield, West Virginia. At the time these samples were received only young apterous forms were present. It is quite probable that these were produced by stem mothers originally present, but no such forms were found. The moss was placed in breeding cages and the young insects reared to maturity. All of these proved to be winged forms which were unable to live upon the moss. Slide mounts of several of these were prepared, but before a careful study could be made of them all of the other alate insects were dead.

As soon as a careful study was made of the specimens it

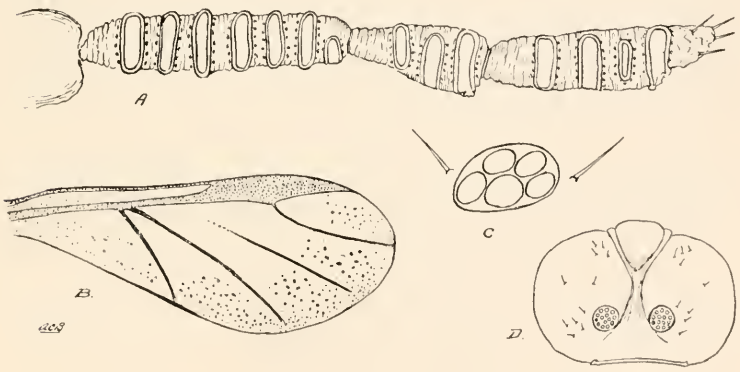
was found that they seemed to fall in the genus *Melaphis*. This had not been suspected or transfers to sumach would have been made to see if by any possible chance these might be the long missing spring migrants of *rhois*. It is true that they differ quite distinctly from *rhois*, but a connection with that species would be a remote possibility and worthy of a trial.

Since the specimens mentioned no other examples have been found and as the species may not be again met with for several years it seems advisable to publish a description of the insect and thus call the attention of other workers to it in the hope that someone may have the opportunity to study its life history.

Melaphis minutus n. sp.

Alate viviparous female.—Color yellowish green. Head and thorax darker. Eyes dark brown. Legs, antennae and borders of wing veins dusky.

Length from vertex to tip of cauda about 0.96 mm., measurements of the antennal segments and their sensoria given in the accompanying



Details of *Melaphis minutus*.

A, Antennal segments III, IV, and V; B, Forewing; C, A caudal pore plate from head; D, Thorax with two pore plates.

table. Sensoria somewhat oval and transverse with a distinctly visible rim and surrounded with a row of dark black points. It is impossible to ascertain the exact nature of these but under the highest power available they appear as minute, thick spines. Segments III, IV and V irregularly imbricated (Fig. 1-a). Head with three pairs of wax-pore plates visible from above, one of these on the vertex, one on the top of

the head, slightly in front of the eyes and the other near the caudal margin of the head. The number of facets in these (Fig. 1-c) varies, the caudal pair having about five each, whereas the more frontal ones have only two. Thorax with two large pore plates near the inner margins of the lobes (Fig. 1-d). These are composed of a rather larger number of facets, there being usually about ten. Forewing (Fig. 1-b) with the veins rather heavy, the media atrophied for some distance at the base. Cubitus and anal arising close together, sometimes united at their bases. Hind wing with the two oblique veins some distance apart at their bases. Hind tibiae about 0.352 mm. long, middle tibiae 0.272 mm. Beak reaching to the hind coxae. Cornicles absent. Abdomen with rather small marginal wax plates. Cauda and anal plate rounded.

Details of Antennae of Melaphis minutus.

Ant. III	Sen.	Ant. IV	Sen.	Ant. V	Sen.
0.08 mm.	8	0.048 mm.	3	0.08 mm.	4
0.096 mm.	7	0.048 mm.	5	0.08 mm.	4
0.096 mm.	7	0.048 mm.	3	0.08 mm.	4
0.096 mm.	7	0.048 mm.	3	0.064 mm.	4
0.08 mm.	7	0.048 mm.	5	0.064 mm.	4

Described from a number of cotypes on balsam mounts bearing Bureau of Entomology, Q., No. 13052, and reared from moss on May 5, 1916. These slides have been deposited in the United States National Museum Collection.

The Early Stages of Catocala minuta and a Description of a New Variety of C. obscura (Lepid.).

By Ernst Schwarz, St. Louis, Missouri.

Ova. Elongated oval, transparent, smooth, glossy, light ochre. Area about micropyle rather large, marked by a ring of many small protuberances; micropyle diminutive.

Larva, Stage I. Head of larva light ochre, body whitish green, tubercle places marked with black dots. The anterior two pairs of prolegs are rudimentary, the posterior two are well developed and are lined posteriorly with black.

Stage II. Head bifurcated, not deeply cleft; color whitish green, and the lines on side of lobes are irregular. Body color greenish white with the longitudinal lines a darker shade of green. The tubercles are marked by black dots. The true and prolegs concolorous; no lateral setae. The ventral portion of the body is white, slightly tinged with green, usual dark blotches present.

Stage III. Head small, bifurcated, rather round, cleft not promi-

nent. The inverted "V" space is lined and centered with an upright black dash. Beyond this space is a perfect "Y" mark of the same color; between this mark and the crest band is a very conspicuous upright line. There are no tubercles below the crest. Body: Color light-ashen, sprinkled with black; tapering in both directions from the eighth segment. There is a mid-dorsal whitish line most conpicuous posteriorly from the elevation on the eighth segment; this elevation has a white center with a black ring at base. All tubercles are black, set in a ring of the ground color of the body; the true legs are concolorous, the prolegs are pinkish with a black oval band, centered with violet. Fringes short, reddish white. The ventral surface is whitish green with the usual blotches black.

*Stage IV. Head with stripes, which are more confluent on top and at the sides than in front. Body gray, with numerous blackish irrorations. Longitudinal lines very narrow and much broken, sometimes hardly traceable, with the intervening space somewhat paler. Eighth segment with the summit of the elevation whitish. Posterior half of seventh and anterior half of eighth segments at the sides pale gray. Fringes at sides fleshy white. Warts black. Underside white, with a black patch on each segment, between the abdominal legs. Thoracic feet translucent white, with black marks on the outside. Abdominal legs with an inverted, black loop on the outside of each. Length 25 mm.

Stage V. Mature larva.—Head semitranslucent, lilac gray, with whitish dots; sides and top of head black. Body sordid gray, densely covered with minute black dots, giving it a gray appearance. Warts small, with the summit orange. Eighth segment with a rather prominent elevation, black, summit pale. Dorsal warts on the last three segments larger than on the others. Fringes at sides pink. Posterior parts of the segments between the longitudinal lines darker than the anterior half. Underside white, with a large black patch on each segment. Thoracic feet bluish white, each with two black dots outside. Length 40 mm. Food plant—Honey locust. (*Gleditsia triacanthos.*)

The descriptions of stages IV and V, as recorded by Beutenmueller for alcoholic specimens, are in every way as I have noted for living material.

Biological Notes. The eggs of *C. minuta* are deposited singly or in clusters, in crevices of bark on large trees, as well as openly on small shrubs of the honey locust. The eggs of this species are not covered with a fibrous substance as are those of *C. titania* and *C. illecta.* The eggs of the latter species are covered with a glossy silken mass. The habits of the larva of

* Stages IV and V are taken verbatim from an article by Wm. Beutenmueller in Bull. Am. Mus. Nat. Hist. 16: 381-82, 1902.

this species are very similar to those of *C. titania*. Bush-beating by day or night is productive for all stages, as they rest near their feeding places. The black tubercles, the thorn-like elevation on the dorsal surface and the whitish mid-dorsal line are all factors in beautifully blending the larva with the color of its surroundings.

Catocala obscura var. **obvia** n. var.

Primaries: Ground color glaucous finely sprinkled with various shades of brown; all lines are prominently dark brown; t. a. line is single-lined anteriorly with light gray. Basal dash is not quite as dark as the t. a. and t. p. lines. This dash runs from the base to the middle of the t. a. line, and from there to the lower part of the subreniform, which is made up of two separate parts. the lower being a part of the t. p. line, while the upper part is oval in shape and smaller in size. Both parts are concolorous with the lining of the t. p. line. The t. p. line is prominent throughout its length, and is lined posteriorly with light gray; the subterminal space is clear light brown; the terminal line is light gray fused with brownish gray, the color of the terminal space. All veins in the space marked with deep brown. The round reniform is concolorous with the subterminal space, ringed and centered with gray.

The lower surface and secondaries above are same as in type. Wing expanse 70 mm.

Habitat.—St. Louis County, Missouri. *Type*, 1 ♂; paratypes, 1 ♂, 1 ♀; collection of author.

These variants are larger in size than *C. obscura*, and I had at first taken them to be the variety *simulatilis* A. R. Grote, but since in the check list of Barnes and McDunnough *simulatilis* is a synonym of *obscura*, I have felt obliged to give this variety the above name.

A new Genus of Cerambycidae from Wyoming (Col.).

By Clarence E. Mickel, University of Nebraska, Lincoln, Nebraska.

MEGACHEUMA n. gen.

Body subparallel, elongate. Last joint of palpi subtriangular, truncate at the tip. Labrum free. Base of antennae partly enveloped by the eyes. Eyes finely granulated. Antennae subserrate, joints three to six produced above at the apex into

short, sharp spines. Prosternum narrow between the coxae, declivous posteriorly. Anterior two-thirds of mesosternum oblique, posterior third flat. Scutellum very broad, rounded behind. Epimera of metathorax produced over the angles of the first ventral segment. Intercoxal process of first ventral segment rounded. Anterior coxae globular, prominent. Anterior tibiae not grooved. Tibial spurs large. Hind tarsi compressed. Apices of elytra rounded.

Genotype, Megacheuma melanosticum n. sp.

Differs from *Cyllene* and *Trichoxys* by having the prosternum narrow between the coxae, declivous posteriorly rather than vertical, in the subserrate antennae, and the rounded apices of the elytra. Differs from *Calloides* in the subserrate antennae and the prosternum narrow between the coxae rather than wide. Differs from *Arhopalus* in the subserrate antennae and the oblique mesosternum. Differs from *Glycobius* in the form of the antennae which is less serrate and less compressed than in that genus; also the prosternum is narrow between the coxae rather than broad as it is in *Glycobius,* and the elytral apices are rounded rather than truncate.

Megacheuma melanosticum n. sp. (Text figs. 1-3).

♀. Length 16 mm. Body subparallel, elongate, thickly clothed with depressed, lemon-yellow pubescence. Head inserted in the thorax; covered with depressed, lemon-yellow pubescence and very sparse, erect hairs; frons flat, impunctate; a median line running from frons to occiput; vertex with very sparse, moderate, shallow punctures; occipital region bare of pubescence, shiny, moderately and irregularly punctate (some of the punctures confluent, others widely separated).

Antennae reddish testaceous, subserrate, joints three to six produced above at the apex into short, sharp spines; first four joints of antennae covered with depressed, cinereous pubescence; remaining joints opaque and puberulent; second joint of antennae about two-fifths the length of the third, which is equal in length to the fourth; apical joint of antennae one and three-fifths times the length of the penultimate joint, suddenly constricted a little beyond the middle and tipped with very fine, golden pubescence.

Prothorax a little wider than long, sides rather strongly arcuate, very narrowly constricted at the base; covered with cinereous pubescence, except the lemon-yellow pubescence on the sternum and sides,

and a brown, trilobate cloud on the disk. Scutellum very broad, rounded behind. Elytra subparallel, clothed with lemon-yellow pubescence, fasciate with black as shown in figure; apices rounded. Anterior two-thirds of mesosternum oblique, posterior third flat.

Legs reddish testaceous, except the femora which are piceous; clothed with short, depressed, cinereous pubescence and longer, semi-

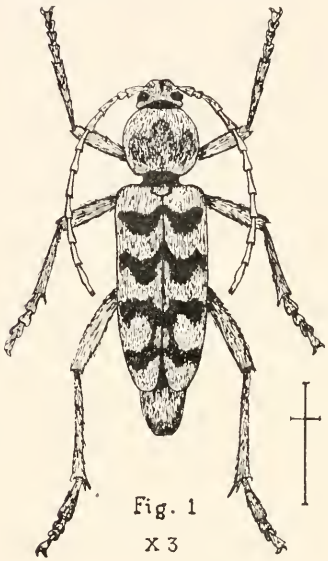


Fig. 1
X 3

Fig. 2
X 15

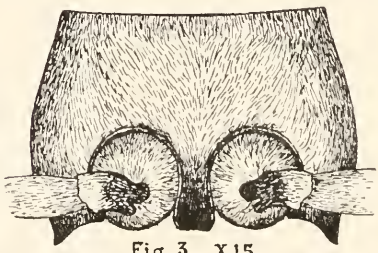


Fig. 3. X15

Megacheuma melanosticum. Fig. 1, dorsal view; fig. 2, antenna; fig. 3, prosternum.

erect, golden-brown pubescence; the latter very sparse on the femora, becoming denser on the tibiae and tarsi; tarsi with a few, interspersed, black hairs; hind tarsi compressed, the first joint equal in length to the combined lengths of the remaining joints.

♂. Length 13 mm. Differs from the ♀ as follows: The finer, recumbent pubescence of prothorax and legs entirely lemon-yellow except the brown, transverse, median fascia on the disk of pronotum; black fasciae on the elytra a little less extended; first joint of hind tarsi slightly longer than the combined length of the remaining joints.

Type, female; Big Horn Basin, Wyoming, August 13, 1910 (H. S. Smith).

Allotype, male; Big Horn Basin, Wyoming, August 13, 1910 (L. Bruner).

The type and allotype are deposited in the entomological collection of the University of Nebraska.

North American Sarcophagidae; New Species of the Genus Sarcofahrtia R. Parker (Dip.).[1]

By R. R. Parker, Bozeman, Montana.

Sarcofahrtia montanensis n. sp. (Text figs. 1, 3).

Holotype (male); collection of R. R. Parker.

Length 10 mm. This species differs from the genotype in the following essential characters: Breadth of front at narrowest part about two-fifths that of eye; cheek height approximately three-sevenths that of eye; arista *very short* plumose; costal spine vestigial; calypters without dark hair on margin; hind femur greatly enlarged, arched and with a deep ventral emargination in profile, a row of bristles dorsally on its distal two-thirds, anteriorly, ventrally, and distally with a single bristle; hind tibia with anterior and posterior beards of medium long hair; middle tibia slightly bearded, submesotibial bristle present; fourth abdominal segment dark pollinose throughout; genitalia specific (Fig. 1); forceps prongs approximated.

Described from one male specimen taken at an altitude of 6,000 feet on Beaver Creek, Madison County, Montana, in August, 1913.

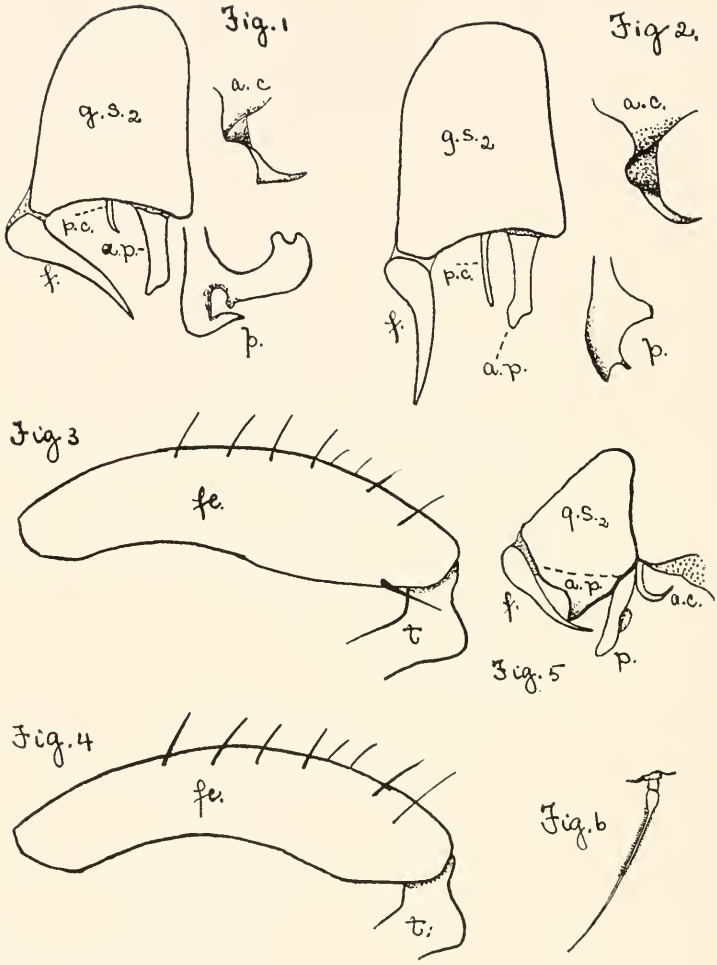
Sarcofahrtia madisoni n. sp. (Text figs. 2, 4).

Holotype (male); collection of R. R. Parker.

Length 9 mm. This species differs little from *S. montanensis* except that the tibiae lack beards, the hind femur is slightly different in shape (Figs. 3, 4), and the genitalia are specific.

Described from one male specimen taken at an altitude of

[1] Contribution from the Entomology Laboratory of the Montana State College, Bozeman, Mont.



EXPLANATION OF FIGURES.

Fig. 1.—Genital segments and accessory structures of *Sarcofahrtia montanensis* n. sp.
Fig. 2.—Genital segments and accessory structures of *S. madisoni* n. sp.
Fig. 3.—Profile view of hind femur of *S. montanensis* n. sp.
Fig. 4.—Profile view of hind femur of *S. madisoni* n. sp.
Fig. 5.—Genital segments and accessory structures of *S. atlantica* n. sp.
Fig. 6.—Arista of *S. atlantica* n. sp.

Abbreviations: *a. p.*, accessory plate; *a. c.*, anterior clasper; *p. c.*, posterior clasper; *f.*, forceps; *g. s. 2*, second genital segment; *fe*, femur; *t.*, tibia; *p.*, copulatory organ.

6,000 feet on Beaver Creek, Madison County, Montana, in August, 1913.

The hind femora of *S. montanensis* and *S. madisoni* resemble those of *Metoposarcophaga incurva* (Aldrich), but lack the ventral protuberance and brush.

Sarcofahrtia atlantica n. sp. (Text figs. 5, 6).

Holotype (male); collection of R. R. Parker.

Length 6.5 mm. The essential characters for distinguishing this species are as follows: Gena with irregular row of cilia; second antennal segment light colored; arista pubescent, distal segment slightly bulbous at base; bend of fourth vein an obtuse angle, thence almost a straight line to the margin; section VI of costa very short; scutellum with more than four pairs of bristles; submesotibial bristle absent; the accessory plate is large and seems to be fused with the second genital segment (Fig. 5).

Described from one male specimen collected at Hamden, Connecticut, May 22, 1911, by B. H. Walden.

This species is markedly different from others of the genus.

Table of Species.

1. Hind femur much larger than normal, in profile with ventral emargination 2
   Hind femur of normal size and shape 3
2. Hind femur as in figure 3; genital parts as in figure 1, *S. montanensis* n. sp.
   Hind femur as in figure 4; genital parts as in figure 2, *S. madisoni* n. sp.
3. Arista short plumose, its shape normal..... *S. ravinia* R. Parker
   Arista pubescent, its distal segment slightly bulbous at base, *S. atlantica* n. sp.

The species herein described as new agree with the generic characters as originally listed (Psyche, vol. 23, p. 31, 1916), except that the tibiae are bearded in *S. montanensis* and the genae bear cilia in *S. atlantica*. The accessory plates are of interest due to their position and shape in *montanensis*, *madisoni* and *ravinia*, and because of their size and apparent fusion with the second genital segment in *atlantica*. The posterior claspers in all the species are smaller than the anterior pair and are approximated on the median dorso-ventral plane. All the species have a row of strong bristles on the "hump" of the first genital segment, but the posterior marginal bristles are weak or lacking.

ENTOMOLOGICAL NEWS.

PHILADELPHIA, PA., JULY, 1919.

International Relations of Entomological Societies after the War.

At the meeting of the Entomological Society of France, held December 24, 1918, the Council of the Society made a report on international relations after the war. After reciting the action taken by the Society from time to time as to its membership from countries with which France was at war, including the expulsion of all those of its members who belonged to enemy nations, as voted on March 28, 1917, the report says [translation]:

Now that the war is finished, the accounts ought to be regulated and definitively closed. Your Council . . . . has been specially incited by the decision recently taken by the interallied conference of scientific academies held at London October 9-11 last. An extract from the resolutions of this conference . . . . have recently been sent to the Entomological Society by the Academy of Sciences. [Then follow quotations from the proceedings of the conference, after which the Council of the society recommended the adoption of this statement:]

The Entomological Society of France declares that, for a period subsequently to be indicated:

1. No individual appertaining to the nations which have made war on the allied nations can be admitted as a member of the Society.

We designedly employ the expression "which have made war," and not "which have been at war," in order to specify that we do not intend to touch by this interdict members of nationalities oppressed for a long time by the German and Austro-Hungarian empires and who found themselves, against their will, in a state of war with us—Danes, Czechs, Poles, Croats, etc., or with greater reason, is it necessary to say, our brothers of all time, Alsatians and Lorrainers.

2. Under penalty of expulsion, no member of the Entomological Society of France can take part in scientific societies of nations which have made war on the allied nations.

Those members of the Society who belong to enemy societies should, as soon as circumstances will permit them, send in their resignations as members of those societies in such way as they prefer, either individually or collectively.

3. Under penalty of expulsion, no member of the Entomological

Society of France can publish anything in the journals or reviews of the enemy countries.

4. The Entomological Society of France does not subscribe directly for any publication of the enemy countries; it will procure those which appear to be necessary through intermediaries.

5. The Entomological Society of France does not furnish its publications directly to any national of the enemy countries; such must, if they desire them, procure them through intermediaries.

Moreover, the Entomological Society of France expresses the wish that, among the reparations which will be demanded from the enemy, the allied and associated governments will include those for injuries caused to allied entomologists by destruction or pillage of their collections and libraries.

The conclusions of this report were put to vote and adopted unanimously. (Bulletin Soc. Ent. France, 1918, No. 20, 1919.)

At the meeting of the same Society, held February 26, 1919, the President, M. E. Moreau, read a letter written in the name of the Entomological Society of Belgium by the latter's Secretary, H. Schouteden, dated Brussels, February 18, 1919, stating, *inter alia,* that the Belgian Society had unanimously ratified the expulsion of all its German and Austro-Hungarian members without exception, and decided to entertain no relations whatsoever with the entomologists of the central empires and not to make any exchange of publications with them. (Bull. Soc. Ent. France, 1919, No. 4.)

The severance of relations between scientific bodies, as above declared, is one of the least of the evils due to the recent war. We can appreciate the feelings of those who decline to have any direct communications with the enemy and it is not to be expected that intercourse will be restored for many years to come. When we turn from these lesser evils to the greater and consider the enormous losses in life, in happiness, in opportunities for productive labor, in property, which to some degree have been experienced by every one of the inhabitants of the civilized world, no punishment can be deemed too severe for the imperialistic group which, positively or negatively, plunged mankind into the horrible struggle. No false notions of forgiveness, charity, or mercy should be allowed to stand between that group and the death penalty.

Entomological Literature.

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded.

The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of papers containing new genera or species occurring north of Mexico are all grouped at the end of each Order of which they treat.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A. London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

2—Transactions of the American Entomological Society, Philadelphia. **4**—Canadian Entomologist, London, Canada. **6**—Journal of the New York Entomological Society. **8**—The Entomologist's Monthly Magazine, London. **10**—Proceedings of the Entomological Society of Washington, D. C. **17**—Lepidoptera, Boston, Mass. **20**—Bulletin de la Societe Entomologique de France, Paris. **22**—Bulletin of Entomological Research, London. **32**—Insecta. Revue Illustree d'Entomologie, Rennes. **33**—Annales de la Societe Entomologique de Belgique, Brussels. **50**—Proceedings of the United States National Museum, Washington. **54**—Proceedings of the Biological Society of Washington, D. C. **59**—Journal of Agricultural Research, Washington, D. C. **77**—Comptes Rendus des Seances de la Societe de Biologie, Paris. **80**—Revue Suisse de Zoologie, Geneve. **82**—The Ohio Journal of Science, Columbus. **85**—The Journal of Experimental Zoology, Philadelphia. **88**—Occasional Papers of the Museum of Zoology, University of Michigan, Ann Arbor. **91**—The Scientific Monthly, Lancaster, Pa. **92**—Archives de Zoologie Experimentale et Generale, Paris. **96**—Physis. Revista de la Sociedad Argentina de Ciencias Naturales, Buenos Aires. **97**—Anales del Museo Nacional de Historia Natural de Buenos Aires.

GENERAL. Hopkins, A. D.—The bioclimatic law as applied to entomological research and farm practice. **91**, viii, 496-513. **Jackson, F. S.**—A method for the preservation of insect larvae and pupae. **4**, li, 117-18. **Lochhead, W.**—Class book of economic entomology (P. Blakiston's Son & Co., Phila., Pa., 436 pp.). **Snyder & Shannon**—Notes on the insect fauna of bank swallow's nest in Virginia. **10**, xxi, 110-12. **Weiss & Dickerson**—Insects of the swamp rose-mallow, in New Jersey. **6**, xxvii, 39-68. **Winn, A. F.**—Kirby's insecta: Vol. IV. Fauna Boreali Americana. Restriction of an indefinite locality. **4**, li, 104.

PHYSIOLOGY, GENETICS, ETC. **Bridges, C. B.**—The genetics of purple eye color in Drosophila. **85,** xxviii, 265-304.

ARACHNIDA AND MYRIAPODA. **Brolemann & Lichtenstein**—Les vulves des diplopodes, memoire preliminaire. **92,** lviii, 173-218. **Fage, L.**—Etudes sur les araignees cavernicoles. III. Le genre Troglohyphantes. **92,** lviii, 55-148. **Walter, C.**—Hydracarinen aus den peruanischen Anden und aus Brasilien. **80,** xxvii, 19-59.

Barrows, W. M.—New spiders from Ohio. **82,** xix, 355-60. **Chamberlin, R. V.**—A new Parajulus from Br. Columbia. **4,** li, 119-20. **Emerton, J. H.**—New spiders from Canada and the adjoining states. No. 2. **4,** li, 105-8.

NEUROPTERA. **Howe, R. H.**—Addition to the Odonata of Franconia region, N. H. **4,** li, 93. **Macnamara, C.**—Remarks on Collembola. **4,** li, 73-80. **Snyder, T. E.**—Some significant structural modifications in nearctic termites. **10,** xxi, 97-104. **Williamson, E. B.**—Notes on species of the genus Heteragrion, with descriptions of new sps. [neotropical]. **88,** No. 68, 65 pp.

ORTHOPTERA. **Hebard, M.**—Studies in the Dermaptera and Orthoptera of Colombia. I. Dermaptera and orthopterous families Blattidae, Mantidae and Phasmidae. **2,** xiv, 89-179. **Vinal, S. C.**—The respiratory system of the Carolina locust (Dissosteira carolina). **6,** xxvii, 19-32.

Rehn & Hebard—A new sp. of grasshopper of the genus Chloealtis from the Pacific slope. **2,** xlv, 81-87.

HEMIPTERA. **Blanchard, E. E.**—Una nueva especie de "Aleurothrixus" (Homoptera, Aleyrodidae). **96,** iv, 344-47. **Bruch, C.**—La forma macroptera de "Neoblissus parasitaster." **96,** iv, 353-4. **Gibson, E. H.**—Notes on the N. Am. species of Corizus (Coreidae). **4,** li, 89-92. **Pennington, M. S.**—Notas sobre la larva y la pseudoimagen de la "Nezara abnormis." Un hemiptero nuevo para la Argentina. **96,** iv, 332-34; 335-6. **Tothill, J. D.**—Some notes on the natural control of the oyster-shell scale. **22,** ix, 183-96.

Baker, A. C.—An undescribed sps. of Dryopea injurious to Phyllostachys. (Aphididae.) **10,** xxi, 104-6. **Davis, W. T.**—Cicadas of the genus Cacama, with descriptions of several n. sps. **6,** xxvii, 68-79. **Ferris, G. F.**—A contribution to the knowledge of the Coccidae of southwestern U. S. (Leland Stanford Jr. Univ. Pub., Univ. Ser., 68 pp.). **Gibson, E. H.**—The genera Corythaica and Dolichocysta (Tingidae). **54,** xxxii, 97-104. **McAtee, W. L.**—Key to the nearctic genera and sps. of Berytidae (Heteroptera). **6,** xxvii, 79-92.

LEPIDOPTERA. **Brethes, J.**—Sobre una lepidopterocecidia del lecheron "Sapium aucuparium." **96,** iv, 356. **Brocher, F.**—Les organes pulsatiles meso-et metatergaux des lepidopteres. **92,** lviii, 149-171. **Ehrmann, G. A.**—New tropical American Papilios. **17,** iii, 36-8. **Giacomelli, E.**—Observaciones entomologicas. **96,** iv, 363-66. **de Joannis, J.**—Les Gallerides doivent former une famille distincte des Pyralidae. **20,** 1919, 105-8. **Knetzger, A.**—Vanessa californica at St. Louis, Mo. **17,** iii, 33-4. **McMurray, N.**—Some luna notes. **17,** iii, 34. **Sanchez, D.**—Sobre ciertos elementos aisladores de la retina periferica del Pieris brassicae. (Trab. Lab. Invest. Biol. Univ. Madrid, xvi, 1-18.). **Stowers, N.**—Notes on Feralia major. **17,** iii, 35-6.

Barnes & McDunnough—A new race of Plebeius icarioides from Vancouver Island. Notes on the genus Olene, with description of a n. sp. **4,** li, 92-3; 103-4. **Busck, A.**—A new sp. of Bucculatrix injurious to hollyhock. **10,** xxi, 109-10. **Clark, B. P.**—Some undescribed Sphingidae (Proc. N. England Zool. Club, vi, 99-114).

DIPTERA. **Brethes, J.**—Description de la galle et la cecidomyie d' "Aeschynomene montevidensis." **96,** iv, 312-13. **Grimshaw, P. H.**—The collection and preservation of diptera. (Scot. Nat. 1919, 55-61, cont.). **Pierre, C.**—Nervulations anormales de quelques dipteres Tipuliformes. **20,** 1919, 75-7. **Townsend, C. H. T.**—Oviposition of Rhinogastrophilus nasalis. **4,** li, 120.

Aldrich, J. M.—Two new gen. of Anthomyiidae. **10,** xxi, 106-9. **Cole, F. R.**—The dipterous family Cyrtidae of No. Am. **2,** xlv, 1-79. **Malloch, J. R.**—A new sp. of Hylemyia and of Coenosia from Canada (Anthomyiidae). **4,** li, 95-6.

COLEOPTERA. **Bedel, L.**—Le Silpha indica, consideré comme enigme est un Megalodacne de l'Amerique du Sud. **20,** 1919, 114-16. **Blair, K. G.**—Notes on the Pythidae with descriptions of n. sps. **8,** 1919, 112-20 (cont.). **Brethes, J.**—Description de deux Coleopteres Cantharides de Catamarca. **96,** iv, 360-1. **Bruch, C.**—Nuevos huespedes de hormigas procedentes de Cordoba. Captura de cerambicidos. Descripcion de nuevos cerambicidos argentinos. **96,** iv, 186-95; 354-5; 355. **Frers, A. G.**—Metamorfosis de la "Lema bilineata." **96,** iv, 336-39. **Pic, M.**—Deux especes nouvelles du genre Camaria, du Bresil. **20,** 1919, 117-18.

Dawson, R. W.—New sps. of Serica (Scarabaeidae). **6,** xxvii, 32-9. **Notman, H.**—C. collected at Cochrane, northern Ontario...., with descriptions of six n. sps. **6,** xxvii, 92-102.

HYMENOPTERA. **Arthus, M.**—Recherches experimentales sur le venin des abeilles. **77,** lxxxii, 414-15. **Brethes, J.**—Description d'une nouvelle espece de "Sphex" de la Republique Argentine. Un Bembecido cazador de hemipteros. **96,** iv, 347-48; 348-9. **Cockerell, T. D. A.**—Bees in the collection of the U. S. National museum.—3. **50,** lv, 167-221. **Frers, A. G.**—Nidificacion y metamorfosis del "Pachodynerus argentinus." **96,** iv, 322-26. **Holmberg, E. L.**—Suple-

mento 1 a las especies argentinas de Coelioxys. **96,** iv, 145-66. **Sladen, F. W. L.**—Further notes on the latimanus group of the bee genus Megachile. **4,** li, 85. **Urbahns, T. D.**—Life history observations on four recently described parasites of Bruchophagus funebius. **59,** xvi, 165-73.

Banks, N.—New Psammocharidae and Philanthidae. **4,** li, 81-5. **Brues, C. T.**—Notes and descriptions of N. Am. Serphidae. **6,** xxvii, 1-19. **Cushman, R. A.**—New genera and sps. of ichneumon flies. **10,** xxi, 112-20. **Gahan, A. B.**—Notes on some genera and sps. of chalcid-flies belonging to the Aphelininae, with description of a n. sp. **50,** lv, 403-7. **Muesebeck, C. F. W.**—Three new sps. of Braconidae. **4,** li, 113-16.

Class Book of Economic Entomology. With Special Reference to the Economic Insects of the Northern United States and Canada. By William Lochhead, B.A., M.S. (Cornell), Professor of Biology in Macdonald College of McGill University, etc. With 257 illustrations. P. Blakiston's Son and Co., 1012 Walnut St., Philadelphia. Price $2.50 net.

This book is another addition to the increasing number of works on this subject, its make-up is admirable and there is a large amount of valuable information condensed into its 436 pages. Part One is devoted to the structure, growth and economics of insects, and includes the external anatomy, special organs of sense, internal anatomy, embryology, development, metamorphosis, insects in relation to birds and plants, relation to the transmission of disease, behavior toward stimuli, to temperature and humidity, distribution and methods of study. Part Two is one of great usefulness as it consists of tables for the identification of insects and the tables are arranged under different headings —cereal crops, indian corn, clover and alfalfa, stored grains, roots, garden vegetables, fruits, shade trees, greenhouse plants, domestic animals, including poultry, and also household pests. Part Three is devoted to the classification and description of common insects. Part Four treats of remedial and control measures and the book concludes with a glossary of terms and an index.

As a text-book and as a practical guide to injurious insects this is one of the very best books thus far published.—Henry Skinner. (*Advt.*).

OBITUARY NOTES

William Francis de Vismes Kane, known for his *Catalogue of the Lepidoptera of Ireland* (1901), *Handbook of the Butterflies of Europe* (1885) and for his writings on other groups of animals, archaeology, etc., died at Drumreaske House, County Monaghan, April 18, 1918. He was born near Exmouth, Devon, England, in 1840. Obituary notices are in the Ent. Mo. Mag., Nov., 1918, and the *Entomologist,* Oct., 1918.

The *Entomologist* (London) for May, 1919, contains an obituary notice of SYDNEY WEBB (1837-1919), a writer of monographs on British Tineina and other Microlepidoptera.

At the meeting of the Entomological Society of France held February 12, 1919, it was announced that "the Grand Duke NICOLAS MICHAILOVITCH, honorary member of the society, and two of his brothers had been recently massacred at Petrograd. The news appears unhappily certain today." The Grand Duke is known entomologically for the nine volumes of "Memoires sur les Lépidoptères rédigés par N. M. Romanoff," St. Petersbourg, 1884-1897, consisting of essays by himself and others on chiefly Palaearctic species and illustrated with colored plates.

Dr. RAPHAEL BLANCHARD, parasitologist and historian of medicine, who died in Paris, February 3, 1919, aged 62, published on pathogenic Diptera and also a separate work, *Les Moustiques* (Paris, 1905). An obituary notice recently appeared in *Science* (April 25, 1919).

JULES KUNKEL D'HERCULAIS, honorary assistant at the National Museum of Natural History, Paris, died December 22, 1918, at Conflans-fin-d'Oise, France, aged 75 years. His work on *Volucella* (1875) was awarded one of the great prizes of the Academy of Sciences. In the course of his studies in Algeria and the Argentine Republic, he published important memoirs on migratory Acrididae and on the early stages of their parasites, *Mylabrus* and Cleridae. (Bull. Soc. Ent. France, 1918, No. 20.)

Dr. W. J. Holland has given an interesting account of the life and activities of the well known collector, HERBERT HUNTINGTON SMITH, in *Science* for May 23, 1919. We hope to have an article from the same pen, specially devoted to Mr. Smith's entomological work, in the next number of the NEWS. Mr. Smith was born at Manlius, New York, January 21, 1851, and killed by accident March 22, 1919, in Alabama.

R. KOBERT, professor of pharmacology at Rostock, whose death on December 27, 1918, aged 64, is announced in *Science* for June 6, was known entomologically for his *Beiträge zur Kenntniss der Giftspinnen* (1901), containing his results on the poison of the Malmignatte (*Latrodectes tredecimguttatus*).

CHANGE OF ADDRESS.

We have moved from 512 Burnside Avenue, East Hartford, to 62 South Whitney Street, Hartford.

After shutting down completely during the war we are starting up again this year with a larger line of

Lepidoptera Specialties

than we had before. Details of our different products will be announced in later advertisements or may be had by direct application to

S. C. CARPENTER, Lepidopterist,
62 South Whitney St., Hartford, Conn.

THIS SPACE

FOR RENT.

NEW ARRIVALS

From Columbia, So. America:

OVER 10,000 BUTTERFLIES, INCLUDING

Morpho cypris
" sulkowskyi
Morpho amathonte
Caligo spp.

From Cuba:

1500 BUTTERFLIES AND MOTHS, INCLUDING

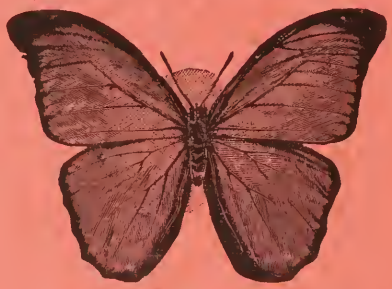
Papilio columbus
" andraemon
" celadon
" devilliersi
Urania boisduvali
Erinyis guttalaris
Protoparce brontes, etc.

From Venezuela:

Over 5000 Lepidoptera
200 Dynastes hercules

From New Guinea:

2000 Coleoptera
200 Orthoptera



From Assam, India:

1200 BUTTERFLIES AND MOTHS, INCLUDING

Papilio arcturus
" philoxenus
Kallima inachis
Brahmaea wallachi

And Many Other Showy Species

From Tibet (Bhutan)

Armandia lidderdalii
Parnassius hardwicki

CATALOGUES OF
ENTOMOLOGICAL SUPPLIES AND SPECIMENS
ON APPLICATION

If interested kindly send your list of desiderata for further information to

THE KNY-SCHEERER CORPORATION

Department of Natural Science
G. Lagai, Ph.D.

New York
404-410 W. 27th Street

OCTOBER, 1919.

ENTOMOLOGICAL NEWS

Vol. XXX. No. 8

Thaddeus William Harris
1795-1856.

1919
National Museum

PHILIP P. CALVERT, Ph.D., Editor.
E. T. CRESSON, Jr., Associate Editor.

HENRY SKINNER, M.D., Sc.D., Editor Emeritus

ADVISORY COMMITTEE:

EZRA T. CRESSON, PHILIP LAURENT, GEORGE M. GREENE, J. A. G. REHN, H. W. WENZEL.

PHILADELPHIA:
THE ACADEMY OF NATURAL SCIENCES,
LOGAN SQUARE.

Entered at the Philadelphia Post-Office as Second-Class Matter.
Acceptance for mailing at the special rate of postage provided in Section 1103, Act of October 3, 1917, authorized on July 19, 1918.

ENTOMOLOGICAL NEWS

published monthly, **excepting August and September,** in charge of the Entomological Section of The Academy of Natural Sciences, Philadelphia, and The American Entomological Society.

ANNUAL SUBSCRIPTION, $2.00 IN ADVANCE.

SINGLE COPIES 24 CENTS.

ADVERTISING RATES: Full width of page. Payments in advance.

One issue,	one inch,	$ 1.20,	two inches,	$ 2.40,	half page,	$ 4.00,	full page, $ 8.00
Five issues,	"	5.50,	"	11.00,	"	17.50,	" 35.00
Ten issues	"	11.00,	"	20.00,	"	35.00,	" 70.00

☞All remittances, and communications regarding subscriptions, non-receipt of the NEWS or of reprints, and requests for sample copies, should be addressed to ENTOMOLOGICAL NEWS, 1900 Race Street, Philadelphia, Pa. *All Checks and Money Orders to be made payable to the* ENTOMOLOGICAL NEWS.

☞All complaints regarding non-receipt of issues of the NEWS should be presented within three months from date of mailing of the issue. After that time the numbers will be furnished only at the regular rate for single copies.

☞Not more than two issues will be replaced gratis through loss, in transit or in change of address, unless such have been registered, at the subscriber's expense.

☞Address all other communications to the editor, Dr. P. P. Calvert, Zoological Laboratory, University of Pennsylvania, Philadelphia, Pa., from September 15th to June 15th, or at the Academy of Natural Sciences, from June 15th to September 15th.

TO CONTRIBUTORS.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" for each number into the hands of the printer five weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form and without covers, will be given free, when they are wanted; if more than twenty-five copies are desired, this should be stated on the MS. The receipt of all papers will be acknowledged. Proof will be sent to authors for correction only when specially requested.

SPECIAL NOTICE TO AUTHORS

Owing to increased cost of labor and materials, no illustrations will be published in the NEWS during 1919, except where authors furnish the necessary blocks, or pay in advance the cost of making blocks, and pay for the cost of printing plates. Information as to the cost will be furnished in each case on application to the Editor. Blocks furnished or paid for by authors will, of course, be returned to authors, after publication, if desired.

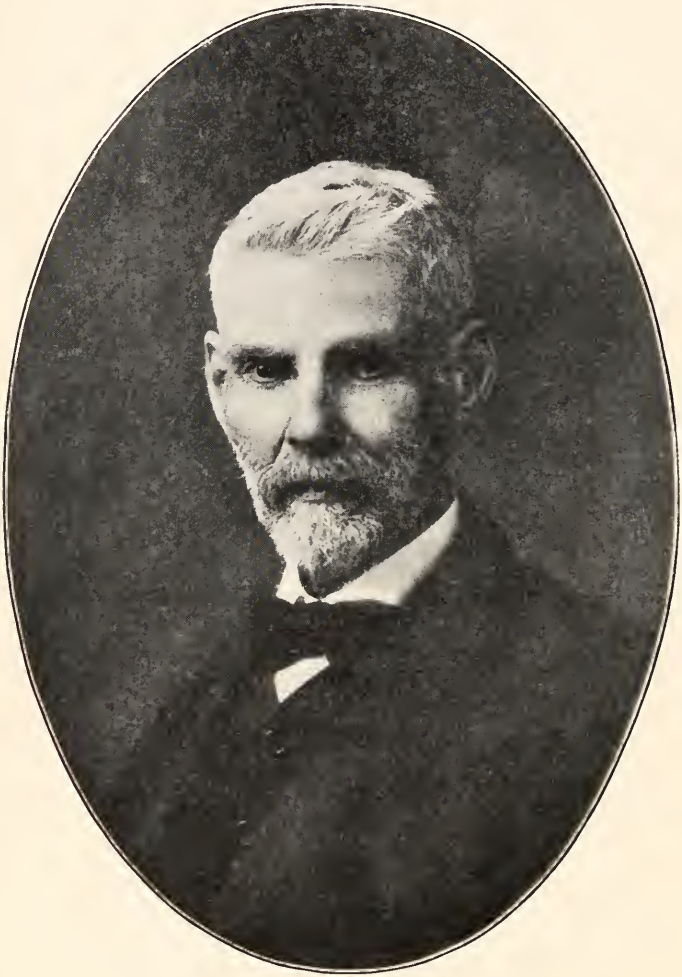
☞ The printer of the NEWS will furnish reprints of articles over and above the twenty-five given free at the following rates: Each printed page or fraction thereof, twenty-five copies, 15 cents; each half tone plate, twenty-five copies, 20 cents; each plate of line cuts, twenty-five copies, 15 cents; greater numbers of copies will be at the corresponding multiples of these rates.

500 PIN-LABELS, 25 CENTS! All Alike on a Strip.

Smallest Type. Pure White Ledger Paper. Not Over 4 Lines or 30 Characters (13 to a Line). Additional characters 1c. each. per Line, per 500, Trimmed.

C. V. BLACKBURN, 12 Pine St., STONEHAM, MASS:, U. S. A.

Smithsonian Institution
National Museum



HERBERT HUNTINGDON SMITH.

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

THE ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XXX. OCTOBER, 1919. No. 8.

CONTENTS:

Holland—Herbert Huntingdon Smith 211
Alexander—Two new Crane-flies from California (Tipulidae, Diptera).... 214
Skinner—A New Species of Argynnis from Utah (Lepid., Rhop.) 216
Lankester—Costa Rican Butterflies (Lepid., Rhop.)..... 216
Funkhouser—A New Tylocentrus from Arizona (Membracidae; Homop.) 217
Felt—Five Non-gall-making Midges (Dip., Cecidomyidae)..... 219
Parshley—On the Preparation of Hemiptera for the Cabinet..... 223
Editorial—The Resting Place of Collections..... 228
Frison—The Occurrence of Eurema mexicana Boisd. in Illinois (Lep.) 228
Severin—The Cause of the Delay of Publication of the Selys Catalogue 229
Scott—Abundance of Cicadas in Beluchistan..... 230
Changes of Address..... 230
Prof. Bruner's Retirement..... 231
Memorials to the late F. D. Godman.. 231
Martin—Notes on the Occurrence of Schizax senex in California (Col., Cerambycidae)..... 231
Entomological Literature 232
Fletcher's Report of the Imperial Entomologist, 1917-1918..... 237
Miyake's Studies on the Fruit-flies of Japan..... 237
Doings of Societies—Feldman Collecting Social (Dip., Col., Hym., Lep.) 238
Amer. Ent. Soc. (Col., Lep., Dip., Orth.)..... .. 239
Ent. Sec., Acad. Nat. Sci. Phil. (Lep.) 240

Herbert Huntingdon Smith.

(Portrait, Plate IX)

In the death of Herbert Huntingdon Smith, which occurred on March 22, 1919, at Tuscaloosa, Alabama, the world lost one of the most indefatigable and successful field-naturalists who has ever lived. In recent years Mr. Smith was afflicted by deafness, and was struck by a railway train, of the approach of which he was unaware, and was instantly killed. He was born at Manlius, New York, on January 21, 1851, and was therefore in his sixty-ninth year at the time of his death. He leaves his widow, Mrs. Amelia Woolworth Smith, and an only son, Huntingdon Holland Smith, the latter a successful young man of affairs, residing at Atlanta, Georgia.

Mr. Smith was well known in scientific and literary circles. While still a student at Cornell University in 1870, he accompanied his friend and teacher, the late Prof. C. F. Hartt, to Brazil. In 1874 he returned to Brazil and spent more than three years in making natural history collections in the vicinity

of Santarem, on the northern tributaries of the Amazons, and on the Tapajos, concluding his stay in the country by a sojourn of some months in the neighborhood of Rio de Janeiro. Shortly after his return to the United States he was commissioned by the Messrs. Scribner to write a series of articles for their magazine upon Brazil and twice revisited the country, on one trip being accompanied by an artist, who was employed to illustrate the papers he wrote. One of the results of these journeys was the volume entitled "Brazil, the Amazons, and the Coast," which was issued from the press of the Scribners in 1879. In the fall of 1880 he married Miss Amelia Woolworth Smith of Brooklyn, N. Y., and together they repaired to Brazil, residing there until the spring of 1886, making their headquarters at Rio de Janeiro, but traveling extensively in all parts of the country and making great collections of natural history specimens. A volume in the Portuguese tongue entitled "De Rio de Janeiro á Cuyabá" was one of the by-products of these years of travel and research. The year 1889 was passed in Mexico, where extensive collections were made for Mr. F. Ducane Godman, who was engaged in the preparation of his monumental work, the "Biologia Centrali-Americana." From 1890-1895 he spent much of his time in the employment of the West Indian Commission of the Royal Society in making a biological survey of Trinidad and the Windward Islands. At the same time he was engaged in writing and editing as a member of the staff of the "Century Dictionary," the "Century Cyclopedia of Names," and "Johnson's Cyclopedia." In these works almost everything relating to South and Central America and their fauna and flora is from his pen. From 1897-1903 he was most of the time in the employment of the Carnegie Museum, three years being spent in collecting in the province of Santa Marta in Colombia. From 1904 until his death he resided in Alabama, during the last ten years of his life being the curator of the Museum at the University of Alabama.

Mr. Smith was interested in all branches of zoology and botany. He collected vertebrates and invertebrates equally

well. In Colombia he made a vast collection of plants. In every field a multitude of new and undescribed species rewarded his diligence. The literature of science for the past thirty or more years so far as it contains descriptions of new or little known neotropical species is everywhere replete with the notation "(*H. H. Smith* coll.)."

The writer has not been able to command the time to make a search for the total of new species which he turned up and which have so far been described, but ventures with perfect confidence the assertion that such species must already aggregate several thousands.

The work done by Mr. Smith in the field of entomology was particularly great. The entomological collections made by him are mainly contained in the National Museum at Rio de Janeiro, in the British Museum (derived from the gift of the collections of F. D. Godman) and in the Carnegie Museum, though parts of his collections are scattered widely in other museums. There are in the Carnegie Museum in the neighborhood of 25,000 species of Brazilian Coleoptera assembled by him and many thousands of species of insects in other orders. A memorandum recently received by the writer from Mrs. Smith states that the Arthropoda collected during the years of Mr. Smith's journeys in Brazil up to May, 1886, aggregated approximately 40,000 species, distributed as follows:

Hymenoptera	5,000
Diptera	2,500
Lepidoptera	2,600
Coleoptera	23,000
Hemiptera	3,300
Orthoptera	600
Neuroptera	300
Arachnida	2,000
Crustacea	250
Total	39,550 species

The collections contained an aggregate of at least half a million of individual specimens. Portions of the collections have been carefully studied and reported upon. Ashmead, Cresson, and others have in part worked over the Hymen-

optera. Williston did something with part of the Diptera. The Lepidoptera so far as they represented the species of Middle-America were studied by Godman and by Herbert Druce. Champion wrote up a part of the Coleoptera, but the beetles of Brazil as a whole remain for the most part to be studied; P. R. Uhler has described many of the Hemiptera, as did also W. L. Distant. The Orthoptera have been studied by Dr. Lawrence Bruner and the Odonata by Dr. P. P. Calvert.

Nevertheless there remains a residuum of unstudied and undetermined material in England and America garnered by H. H. Smith which still calls for attention and which probably represents many thousands of nondescript species, especially among the micro-coleoptera.

Herbert H. Smith and William Doherty, both Americans, were undoubtedly the two ablest zoological collectors in the field during the last two decades of the Nineteenth and the first decade of the Twentieth Century.

W. J. Holland.

Ocean House, Watch Hill, R. I., Aug. 26, 1919.

Two new Crane-flies from California (Tipulidae, Diptera).

By Charles P. Alexander, State Laboratory of Natural History, Urbana, Illinois.

Erioptera (Acyphona) sparsa sp. n.

General coloration yellow; femora with a narrow dark-brown band just before the tips; wings subhyaline with sparse brown markings.

♀. Length 5.8 mm.; wing 6.4 mm.

Rostrum and palpi dark brown. Antennae with the basal segments yellowish, the apical half brown. Head dark.

Mesonotal praescutum dull yellow with three brown stripes; scutellum yellowish. Pleura more infumed. Halteres pale, the knobs orange-yellow. Legs with the coxae dull yellow; trochanters yellow; femora yellowish with a narrow brown ring that is close before the tip; tibiae yellow, the tips narrowly and indistinctly darkened; tarsi brown, the metatarsi paler basally. Wings pale yellowish subhyaline with dark-brown markings, including a narrow seam along the cord; small spots at the base of the wing and the origin of the sector;

larger marks at the ends of the longitudinal veins, $R4+5$ excepted. Venation: Similar to the closely related *E. armillaris,* but *m* slightly before midlength of $M3$.

Abdomen dull yellow, the pleural region brownish. Ovipositor very long and slender.

Holotype: ♀, Berkeley, California, May 28, 1915 (M. C. Van Duzee).

Type in the collection of the author.

E. sparsa is very similar to *E. armillaris* O. S. of the Eastern United States, but the wings are paler with a much more restricted pattern, the marks at the origin of the sector and the ends of the anal veins small, and the femoral brown ring narrow and closer to the tips.

Limnophila hepatica sp. n.

General coloration dark liver-brown, the thorax unstriped; wings with a faint brownish suffusion, the stigma and a blotch at *r-m* brown.

♀. Length 7.5 mm.; wing 8 mm.

Rostrum and palpi dark brown. Antennae dark brown, the first scapal segment elongated. Head dark gray.

Mesonotum dark liver-brown, shiny, without stripes, the postnotum a little more reddish. Pleura dark brown, the dorsopleural membranes more yellowish. Halteres pale, the knobs a little darkened, the stems rather elongated. Legs with the coxae yellowish, the fore coxae a little darkened; trochanters yellowish; legs except the fore pair broken, these latter with the femora dark brown, the basal quarter more yellowish; tibiae and tarsi dark brown. Wings with a faint brown suffusion; stigma large, oval, dark brown; a brownish cloud on *r-m* and adjoining veins; base of the wing slightly yellowish; veins dark brown. Venation: $Sc1$ ending opposite the basal deflection of $R4+5$; *r* removed from the tip of $R1$; Rs long; $R2+3$ a little shorter than the basal deflection of $Cu1$; *r-m* in alignment with the basal deflections of $R4+5$ and $M1+2$; cell *1st M2* small; petiole of cell $M1$ about as long as this cell; basal deflection of $Cu1$ slightly beyond midlength of cell *1st M2*.

Abdominal tergites dark brown, the basal shield of the ovipositor dull black, the valves long and slender, rusty in color; sternites dull yellowish.

Holotype: ♀, Fieldbrook, California, May 18, 1903 (H. S. Barber).

Type in the collection of the United States National Museum.

A New Species of Argynnis from Utah (Lepid., Rhop.).

By HENRY SKINNER.

Argynnis utahensis, n. sp.

Upperside. Primaries dull fulvous with the extra discal rounded spots as in *Argynnis chitone* except that the spots near the apex are somewhat smaller than in that species and they are not so black and well pronounced. The basal area of the wing is not nearly so dark as in *chitone.*

Secondaries are the same color as the primaries with the usual black markings. The base of the wing is not obscured by dark scales as is the case in some of the allied species.

Underside. Primaries relatively light in color with two spots near the apex and three of the submarginal lunules faintly silvered.

Secondaries much as in *chitone,* but lighter in color with less black around the silver spots. Some specimens are devoid of silver spots.

The female is like the male, but slightly larger, and the base of the primaries is much redder than in the male.

This is the species that has always been confused with *chitone* Edw. It can be readily differentiated by less black on the basal areas above and below and by the generally lighter colors.

The male expands 53 mm. and the female 55 mm.

The *type* was taken by the writer in City Creek Canyon, Salt Lake City, Utah, July 6th, and the allotype at Silver Lake, Brightons, Utah, July 12th. There are nine paratypes from City Creek Canyon, taken on the 4th to the 6th of July. Fourteen specimens from Ogden, Utah, and four from Park City, Utah, taken by A. J. Snyder in the first half of July. Three specimens from Provo, Utah, taken by T. Spalding in July, and four specimens from David Bruce labelled "Utah."

The types and other specimens are in the collection of The Academy of Natural Sciences of Philadelphia.

Costa Rican Butterflies (Lepid., Rhop.).

On December 30th (1918) I took on the Cairo branch a female of *Hypolimnas misippus,* which may be a first record for Costa Rica.

We have found larvae and reared them, on *Hygrophila confuta* (Acanthaceae), of *Amphirene epaphus,* though as this is so common a species, it is unlikely to confine itself to that plant and probably affects other species of the same family. The larva is very handsome, velvety black with pale yellow bars at the segments, the chrysalis grass green.—C. H. LANKESTER, Cartago, Costa Rica.

A New Tylocentrus from Arizona (Membracidae; Homoptera).

By W. D. FUNKHOUSER.*

(Plate X)

The genus *Tylocentrus* VanDuzee was erected for the accommodation of *T. reticulatus* VanDuzee, described† from specimens from Utah and Arizona. The type species is apparently common throughout the southwestern part of the United States and I have received from Mr. H. H. Knight of Ithaca, New York, a long series of specimens collected by him during the Summer of 1917 in the vicinities of Fabeus, Texas, and Ft. Stockton, Texas. Mr. Knight's field notes record the host-plant of this insect as the "screw-bean" (*Strombocarpa odorata* (Torrey) A. Gray)‡ and the specimen labels bear the dates of July 5 for the Ft. Stockton material and July 9 for the Fabeus specimens.

Since the description of the type species, the genus has remained monotypic but the following insect must now be added:

Tylocentrus quadricornis sp. nov. (Plate X; Figs. 1, 2, 3 and 4).

Near *Tylocentrus reticulatus* VanDuzee but differing principally in the shape of the head and clypeus, the shape of the posterior process and in having four distinct pronotal horns in the female.

Robust, mottled yellow, brown and black, finely punctate, pubescent; four well developed pronotal horns extending in a row across the dorsum in a line with the humeral angles, the middle pair being the shorter; scutellum plainly exposed, bidentate; posterior process narrow at base, high and arcuate at extremity, slightly elevated above tegmina; tegmina semiopaque, mottled yellow, ferruginous and brown; legs yellow, banded with brown.

Head twice as wide as long, very roughly sculptured, swollen in centre, brown with black markings at margins of eyes and a black spot above each ocellus, finely punctate, closely pubescent with whitish

* Contribution from the Zoological Laboratory of the University of Kentucky.

† VanDuzee, E. P. Studies in North American Membracidae. Bull. Buff. Soc. Nat. Sci. ix, pp. 118-119, pl. 2, figs. 39 and 40. April 18, 1908.

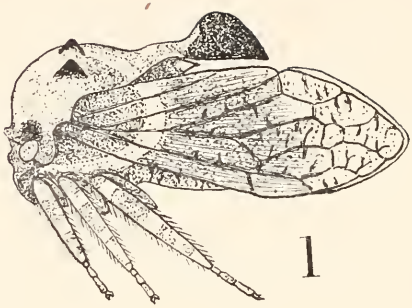
‡ *Syn. Prosopis pubescens* Bentham. ?

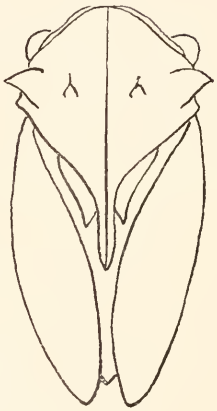
hairs; base of head elevated and strongly sinuate, highest above ocelli; eyes gray, elongate, much wider than high; ocelli small, brown, not conspicuous, protruding, about equidistant from each other and from the eyes and situated about on an imaginary line drawn through centers of eyes; inferior margin of genae convex, protruding, sinuate; clypeus three times as long as broad, brown in centre, darker at margins, luteous at tip, extending for more than two-thirds its length below inferior margins of genae, punctate, pubescent, tip rounded, swollen, pilose with long white hairs.

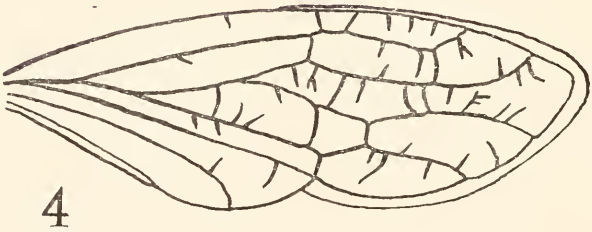
Pronotum yellow with a spot over each eye, the tips of the horns and the apical half of the posterior process black, the area behind the horns and before the base of the posterior process brown, the entire pronotum finely punctate and densely pubescent with white or grayish hairs; metopidium much wider than high, slightly sloping, somewhat convex and swollen in center, entirely light yellow except for a black callosity above each eye; median carina distinctly percurrent; humeral angles large, prominent, triangular, blunt, extending outward almost as far as the suprahumeral horns above them; suprahumeral horns short, heavy, blunt, somewhat flattened dorso-ventrally, about one-fourth as long as the distance between their bases, brown with the tips black, extending outward and upward but not at all forward or backward, apices blunt, roughly carinate and slightly bent downward; between the two suprahumeral horns and on a line with them are two other horns which are short, conical, blunt, yellow with black tips, extending almost directly upward, about equidistant from each other and from the suprahumerals and about as long as the distance between their bases; scutellum plainly exposed on each side, about as long as broad, strongly bidentate, base brown, punctate and pubescent, tip yellow; posterior process short, slightly upraised, basal half narrow and nearly straight, distal half wider and strongly upraised to form a high arcuate crest, this crest longer than high, the tip black and acute and extending almost to the internal angles of the tegmina.

Tegmina semiopaque; base brown, coriaceous, punctate and pubescent; next to the coriaceous base a semicircular whitish fascia; central part of tegmina brown; tip lighter and subhyaline; veins very strong, heavy, brown, with short irregular branches projecting out into the cells. Apparently five apical and three discoidal cells. Marginal membrane very narrow.

Sides of thorax brown, punctate and pubescent. The white arc made by the fascia just before the base of the tegmen is continued downward over the sides of the metathorax and mesothorax and upward over the pronotum by a line of white tomentose pubescence. Abdomen brown, margins of segments lighter. Femora brown; tibiae strongly mottled with alternate patches of brown and yellow, spinose; tarsi flavous; claws brown.







TYLOCENTRUS QUADRICORNIS.—FUNKHOUSER.

Length including tegmina 5.2 mm.; width between tips of suprahumeral horns 2.8 mm.

Type: female. *Locality*: Lewis Springs, Arizona.

Described from two females collected at Lewis Springs, Arizona, on June 18, 1915, by Mr. Harold Morrison. Mr. Morrison's field notes record that the insects were taken in "miscellaneous beating and sweeping" but no data as to its peculiar host-plant are available. Type and paratype in author's collection.

EXPLANATION OF PLATE X.

Fig. 1. Lateral view of *Tylocentrus quadricornis* sp. nov.
2. Front view of head and thorax.
3. Dorsal outline.
4. Right front wing of type specimen.

Five Non-gall-making Midges (Dip., Cecidomyidae).

By E. P. FELT, Albany, New York.

The members of two subfamilies and one tribe of the third subfamily of our gall midges, make no galls and are of little interest to the students of vegetable deformations. These anomalous gall midges are extremely interesting to the systematist, morphologist and the biologist because in many respects they present most interesting gradations between the gall producers and the series of small flies, living for the most part in decaying vegetable matter.

[The types, presumably, are in the State Museum at Albany. —ED.]

Prionellus eremi n. sp.

The male described below was collected at Brainerd Lake, Boulder County, Colorado, by Prof. T. D. A. Cockerell, dated August 28, and forwarded in April, 1918. This species is allied to *P. hesperia* Felt and *P. latipennis* Felt, from both of which it may be easily separated by its greater size and the relatively longer basal enlargement of the flagellate antennal segments and the relatively shorter fourth palpal segment.

♂. Length 1.5 mm. Antennae nearly as long as the body, sparsely haired, reddish brown, 14 segments, the 5th with a stem ¾ the length

of the subcylindrical basal enlargement, which latter has a length 2¼ times its diameter. Terminal segment reduced, with a length about twice its diameter and tapering to an irregular, rudimentary knob. Palpi: first segment short, quadrate, second a little longer, more slender, third as long as the second, and the fourth about ½ longer than the third.

Mesonotum dark reddish brown. Scutellum reddish brown. Postscutellum yellowish brown.

Abdomen mostly dark yellowish brown, the basal genitalic segments darker.

Wings hyaline; halteres fuscous yellowish. Coxae yellowish brown. Legs mostly fuscous straw, the distal tarsal segments dark brown.

Genitalia: basal clasp segment short, stout, terminal clasp segment short, somewhat swollen distally, tapering and curving to an irregular, obtuse, heavily setose apex.

Type Cecid. A. 2903.

HORMOSOMYIA n. gen.

The genus belongs in the Porricondylariae and may be easily recognized by the five long veins, the cross vein being nearly parallel with costa, the fourth vein simple, weaker than the others and obsolescent basally, the fifth vein simple and the sixth free. The structure of the antennae and the genitalia of the male are most suggestive of *Porricondyla* Rond. from which it is easily separated by alar characters.

Type: *H. oregonensis* n. sp.

Hormosomyia oregonensis n. sp.

♂. Length 4 mm. Antennae as long as the body, sparsely haired, 16 segments, the 5th with a stem 2½ times the length of the basal enlargement, which latter has a length nearly three times its diameter, a sub-basal whorl of short, stout setae, a subapical whorl of much longer, slender setae and a sparse apical whorl of shorter, slender setae lying mostly parallel with the axis of the segment. Terminal segment produced, tapering gradually and with a length about five times its diameter and apically an irregular, spindle-shaped appendage. Palpi: moderately long, first segment with a length about three times its diameter, the second and third segments each nearly as long as the first, and the fourth segment nearly twice the length of the third and somewhat dilated.

Mesonotum shiny reddish brown, the submedian lines sparsely haired, the collar, the posterior median area, scutellum and postscutellum mostly yellowish.

Abdomen rather thickly haired, dark brown, genitalia fuscous yellowish.

Wings hyaline, subcosta uniting with the margin near the basal half and the cross-vein nearly parallel with costa, the third vein stout, strongly curved distally and joining the margin well beyond the apex. Fourth vein simple, weaker than the third, obsolescent basally. Fifth vein a little stouter than the third, simple, obsolescent basally; sixth vein simple, moderately stout, strongly curved distally and uniting with the posterior margin a little before the basal half. Halteres mostly pale yellowish.

Legs nearly uniform dark brown, the femoro-tibial and the tibio-tarsal articulations narrowly yellowish. Claws moderately long, stout, curved, unidentate, the tooth with a series of minute denticulations basally. The pulvilli about half the length of the claws.

Genitalia: basal clasp segment moderately long, stout; terminal clasp segment long, tapering triangular when seen from the dorsum, the length being about 2½ times the greatest width. The apex slightly curved and obtuse, and not noticeably chitinized. Dorsal plate short, broad, tapering to a broadly, slightly emarginate, somewhat lobed posterior margin. Ventral plate divided, the lobes broadly quadrangular and sparsely setose. Style short, stout, acute apically.

Type Cecid. 1790.

This remarkable specimen was collected by Mr. F. R. Cole, October 10, 1918, at Forest Grove, Oregon.

Porricondyla consobrina n. sp.

This insect was collected August 3, 1918, at Gull Lake, near Muskoka, Ontario, Canada, by H. S. Parish. The species is very close to *P. juvenalis* Felt, from which it is most easily separated by its somewhat larger size, paler color, reduced chitinization of the abdominal segments and the distinctly longer tips of the lance-like harpes.

♂. Length 2.5 mm. Antennae a little longer than the body, thickly haired, fuscous, the stems whitish transparent, 16 segments, the fifth with a stem two and one-half times the length of the basal enlargement, which latter has a length one-half greater than its diameter. Terminal segment with a length four times its diameter and tapering gradually and nearly uniformly to an acute apex. Palpi: first segment with a length about four times its diameter, the second about as long as the first, a little stouter, the third one-half longer than the second, more slender, and the fourth one-half longer than the third.

Thorax and body a nearly uniform pale yellowish. Halteres yellowish transparent.

Coxae and femora basally of the fore and midlegs pale yellowish, the entire femora and tibiae basally of the hind legs pale yellowish, the remainder of the legs dark brown. Claws moderately long, stout, slightly curved, the pulvilli nearly as long as the claws.

Genitalia: basal clasp segment short, very broad, terminal clasp segment short, greatly swollen and heavily spined apically, dorsal plate long, broad, deeply and narrowly incised, the lobes roundly quadrate and sparsely and coarsely setose apically; ventral plate moderately long, broad, deeply and roundly emarginate, the lobes narrowly rounded, setose. Harpes slender, lance-like, the strongly chitinized apex turned at almost right angles and with a length nearly one-half that of the basal portion.

Type Cecid. 1797.

Porricondyla fultonensis n. sp.

This male was taken probably on June 17, 1916, by Mr. C. P. Alexander at Woodworth's Lake, Fulton County, New York, and forwarded for determination in December, 1918. It falls in the series with sixteen antennal segments and is allied to *P. canadensis* Felt and *P. dilatata* Felt, from both of which it is easily separated by antennal differences as well as other structural characteristics.

♂. Length 2 mm. Antennae a little longer than the body, thickly haired, dark brown, the stems whitish transparent, 16 segments, the 5th with a stem 1¼ the length of the basal enlargement, which latter has a length 2¼ times its diameter. Terminal segment slightly produced and with a subglobose node apically. Palpi: first segment with a length nearly three times its diameter, the second a little shorter, the third at least the length of the second, and the fourth nearly twice the length of the third and somewhat compressed.

Mesonotum dark reddish brown, the submedian lines sparsely haired. Scutellum and postscutellum yellowish orange.

Abdomen sparsely haired, dark brown, genitalia reddish yellow. Halteres mostly dark brown, fuscous yellowish apically. Legs mostly fuscous straw; coxae dark brown. Claws stout, simple, the pulvilli about half the length of the claws.

Genitalia: basal clasp segment broad, sparsely setose, terminal clasp segment as long as the basal clasp segment, slightly curved, moderately stout, tapering at both extremities. Dorsal plate short, broad, rather deeply and roundly emarginate, ventral plate a little longer, broad and broadly rounded.

Type a2953.

Colpodia colei n. sp.

The male described below was collected June 2, 1918, at Forest Grove, Oregon, by F. R. Cole. It is related to *C. americana* Felt, from which it may be most easily separated by its larger size and marked differences in the structure of the genitalia.

♂. Length 2 mm. Antennae one-half longer than the body, sparsely haired, dark brown, ? 16 segments, the fifth with a stem twice the length of the basal enlargement, which latter has a length one-half greater than its diameter. Palpi: first segment with a length three times its diameter, second as long as the first, stouter, the third one-half longer than the second, more slender, and the fourth one-half longer than the third, more slender.

Mesonotum dark brownish red. Scutellum and postscutellum mostly pale yellowish.

Abdomen yellowish brown. Halteres pale yellowish.

Legs a nearly uniform pale straw. Claws moderately long, stout, unidentate, the pulvilli nearly as long as the claws.

Genitalia: basal clasp segment short, stout, terminal clasp segment short and greatly swollen, apically pectinate. Dorsal plate moderately long, deeply and narrowly incised, the lobes broadly rounded. Ventral plate long, incised, the lobes narrowly rounded. Harpes apparently consisting of two slightly bowed, long chitinous pieces, the tips crossing near the median line and a basal chitinous structure with heavy, sublateral processes extending posteriorly. The structure of the harpes is very different from *C. americana* Felt.

Type C. 1791.

On the Preparation of Hemiptera for the Cabinet.

By H. M. Parshley, Smith College, Northampton, Massachusetts.

Some years ago the Editor of this Journal published a leading article in which he urged the importance of care and neatness in mounting and labeling insect specimens, and no doubt there has been some general improvement in subsequent years, especially in the matter of recording full data. But there is still need for attention to this department of entomological technique, as I am frequently reminded in going over the collections of Hemiptera which pass through my hands. It may seem surprising to note that the worst offenders in this respect

are not to be found among those who pursue the study as an avocation, often interested more particularly in other orders, but rather among the students of agricultural colleges where entomology occupies a large share of attention and each of the various groups of insects presumably receives due notice. Many of these student collectors are to become professional entomologists and yet their instructors, in many cases, fail to insist upon this elementary matter of adequate skill in mounting specimens and preserving them in a condition fit for study. Still, perhaps this is what we might reasonably expect. To my mind this state of affairs is one of the manifestations of the "practical" spirit which is making such notable headway in the state universities—the same spirit which eliminates the study of the classics, elevates every trifling trade to the dignity of an academic pursuit, and in general places the things of the dollar above the things of the spirit. The science of entomology has reached its present state of advancement very largely through the unpaid effort, the labor of love, of enthusiasts, and we may hardly look for any progress that is worth while, in the technique of mounting specimens or in matters of higher import, if entomologists, professional or otherwise, come to be actuated as a class by any spirit other than that of the true *amateur*.

Among the dealers also are many who display a hopeless lack of skill in mounting specimens, probably because of the same fundamental reason; the shining exceptions are invariably men who love the study for itself, quite apart from any commercial interest. In spite of the immense labor involved, it is usually necessary for the purchaser to order his specimens unmounted and to provide his own printed labels, if he is to obtain materials worth keeping. Strange indeed that in the case of dealers practical considerations do not lead to proficiency in the methods required in mounting insects of the various orders. Slovenly mounting is an unmixed, wide spread, and unnecessary evil; poorly mounted specimens are frequently almost worthless for purposes of study and always quite unfit for admission to the collection of the student who feels

any concern for the neatness of his cabinet. How many tedious hours must be spent in relaxing and remounting examples which by reason of extreme rarity or some special scientific interest are withheld from the waste-basket—a fate otherwise well deserved! It requires but little additional effort to prepare specimens properly in the first place, and it is hoped that the suggestions offered below may be of some service in the matter.

In mounting Hemiptera, only the black steel pins of American manufacture should be used. They are of course far superior in every way to the bright brass pins, so liable to corrosion and so prone to bend, and yet some collectors still use the latter. It is true that the steel pins will rust in the presence of moisture, as at the sea-shore or when the collection is stored in a basement, but under the same conditions mould will grow on the specimens and hence undue humidity must always be avoided, aside from the question of pins. It is often recommended that Hemiptera be pinned through the scutellum, but with certain families this is not advisable. In the Reduviidae, for instance, the scutellum is proportionately so small as to be entirely destroyed by a pin otherwise of suitable size for the insect, and in such cases it is usually best to pin through the posterior lobe of the pronotum. The Corixidae, where the scutellum is usually concealed, may be pinned through the right hemielytron, like beetles. For convenience in comparing specimens under the binocular, as well as for aesthetic reasons, the insects should all be set at a uniform distance from the head of pin, with about 1/4 the length of the pin projecting above the insect—an oft-repeated injunction but one little heeded. This is to be accomplished with the aid of the pinning block described below. As it is often necessary to examine the hind wings and dorsal surface of the abdomen, a specimen or two of each sex in every species should be pinned with the wings unfolded, but not spread on a setting board, an artificiality not needed in mounting Hemiptera. Specimens so small as to be injured in the least by a No. 2 pin should be mounted on points, *e. g.*, almost all Miridae, Antho-

coridae, Saldidae, etc. Disregard of this rule, which is not uncommon, results either in badly damaged specimens, or the use of inconveniently fine pins, or both.

There are many forms of double mounts, recommended for use in mounting small insects. For Hemiptera I find the cardboard point most suitable, the others clumsy in appearance as compared with the minute specimens which they are designed to support, and otherwise objectionable. But there are points and points! Thin paper is not at all suitable, though often used: extremely large or extremely small points are alike bad; celluloid is refractory in several ways. A rather heavy white bristol board of the very best quality may be recommended as the finest material. This should be cut in strips 7-8 mm. in width, from which the elongated triangular points are easily made with scissors, the tips of varying widths from sharp to blunt depending on the form and size of the insect to be mounted. The point should be placed on a No. 3 black pin at a height slightly less than that of ordinary pinned insects, and the tip bent sharply downward so that it may be affixed to the right side of the insect with a minute quantity of adhesive. By this method of mounting, the entire surface of the specimen, except a part of one side, is in full view—a great and obvious advantage, but it is rare indeed to meet with material thus prepared. In the few cases where the form of the body does not lend itself to this method of mounting, a very narrow point may be used, so placed as to conceal as little of the ventral surface as possible. The best adhesive material, in my experience, is white shellac, which may be obtained in dissolved form at hardware stores. By a little manipulation, drying or thinning with absolute alcohol according to circumstances, a consistency may be obtained such that the specimens will remain in place immediately upon affixing. The fixative should be very restricted in quantity, so that the student may be spared the labor of experimenting with various solvents in the effort to bring to light the imbedded specimen.

For fixing specimens, points, and labels at uniform heights on the pins, some form of pinning block is a necessity. I have

found a metal block superior in many respects to the more common wooden kind. It is a cylindrical piece of brass, 5 cm. in diameter by 4 cm. in height, with three numbered holes, bored very carefully with a 1.5 mm. drill to the following exact depths: No. 1, 27 mm. for fixing points; No. 2, 17 mm. for locality labels; No. 3, 10 mm. for adjusting the height of specimens by inserting the head of the pin.

Most collectors now label their specimens with locality and date of collection, but there are still those who omit to mention the collector, perhaps because of embarrassment at seeing such frequent repetition of their own names. This natural feeling of modesty should, however, be repressed, since it is frequently of the utmost importance for the student to know who the collector is. Very often it is desirable to write to the collector for further information regarding some specimen under examination, but more important than this is the fact that the collector's name indicates definitely the ultimate authority, the person responsible for the record. There is unfortunately a wide variability among collectors in the care which they bestow upon their specimens and hence in the reliance which can be placed on their data, so that in the presence of specimens indicating unusual distribution, for instance, the student has every reason to require the collector's name. As an instance in point, might be cited certain specimens of Hemiptera which came to my notice some time ago. The data accompanying these specimens indicated an occurrence far beyond the known range of the species, and I would have viewed the case with some suspicion had not the collector's name, printed on the labels, been that of a Coleopterist well known for his extremely careful methods of work.

One of the finest aspects of our science is the opportunity for co-operation which it affords. Most entomologists are specialists of necessity and all frequently meet with materials which would be of great value to others, if collected and preserved with care. It may steal some attention from one's especial pursuit to learn and practice faithfully the methods of others, but it would seem most decidedly worth while, most certain to advance the study of entomology in general.

ENTOMOLOGICAL NEWS.

PHILADELPHIA, PA., OCTOBER, 1919.

The Resting Place of Collections.

If possible, decide during your life time what you wish done with your collection after your death, and make a will. If you don't do this the collection will probably go to the very place you would least like to have it; or it may go to the devil via the *Anthrenus* route.

Do not give it or will it on condition that it be kept intact, as that is a most foolish form of egomania and will defeat your wishes and make the collection a source of trouble wherever it is, and it will be practically neglected.

You must trust some one and why not trust the entomologists that will have charge of it? A collection that is not growing and added to, unless it contains types, is surely a dead one. Imagine a museum with numerous collections to be kept intact and separate, and examining all of them, one after the other, for purposes of study. Memorials should take some other form: perhaps special pin labels and a good picture of the donor, displayed in the museum, suitably inscribed. There is a tendency in these days to keep holotypes separate and this would also make the intact collection of less use for study. There are many excellent reasons for our advice and a number of cases in illustration could be cited, but space forbids.—H. S.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

The Occurrence of Eurema mexicana Boisd. in Illinois. (Lepid.).

The capture of *Eurema mexicana* Boisd. in Illinois is so uncommon an occurrence that a few notes on the subject are perhaps not out of place.

Dr. Henry Skinner, in his Synonymic Catalogue of the North American Rhopalocera, listed this species as occurring in Mexico, the extreme southwestern states and occasionally in Nebraska, Iowa and

Illinois. Dr. H. G. Dyar records the species from Mexico and on the authority of Dr. Skinner from the Mississippi Valley. Dr. W. J. Holland says the species is abundant in Mexico, common in Arizona and not uncommon in Texas.

On October 18 and 19, 1911, the writer took fourteen specimens of this species at Champaign, Illinois. Prior to that time and since then no additional specimens of the species have been taken. My attention was first attracted to this butterfly because of its slow low flight, frequently interrupted by short stops among the grasses on the ground. Any number of specimens of this pierid might have been captured as they were flying in flocks as certain other butterflies do during migrations. The butterflies were flying in a southwesterly direction.—THEODORE H. FRISON, Champaign, Illinois.

The Cause of the Delay of Publication of the Selys Catalogue.

The publication of the *Catalogue des Collections Selys* has been completely stopped during the war because, in order to proceed with it, it would have been necessary to submit it to the odious German censorship.

It was not that there was ever any fear that authorization to publish would have been refused us. The enemy, on the contrary, would have asked nothing better than to be able to show publications made in Belgium; he would have drawn an argument from them to defend his bad cause and make the world believe that the sufferings of the Belgian people were greatly exaggerated, since the intellectuals could continuè their work under the shield of the magnanimous occupant!

Besides, ever rapacious, he found in the conditions regulating authorizations a source of benefices: whoever published must deliver to the censor a certain number of copies and when works of a certain commercial value were in question, it was extortion erected into a system. Moreover, distribution of copies could only take place through the German booksellers who centralized everything at Leipzig, from which place delivery was made to foreign countries.

It seemed, in these circumstances, neither dignified nor patriotic (and never would we have consented) to submit the publication of the scientific monument erected to the memory of the great Belgian, that Edm. de Selys Longchamps was, to such shameful merchandising.

We do not think, moreover, that the delay caused by the war to so many publications, begun or in preparation, constitutes a scientific calamity. Science, who is sometimes invoked to an extent beyond her higher and imprescriptible rights, is rarely injured by delays of publication; often she gains thereby, for the works deferred are frequently better, more finished, more matured. That *scientists* declare themselves injured we willingly admit, but that has nothing in common

with the interest of *science* herself. There is a confusion here which is often desired and which it is good to dissipate. Be that as it may, when priority is concerned, the interest of describers is entirely worthy of consideration; we guard ourselves from misconception and we honor the more those whose sense of their dignity and their patriotism has caused them to decide to impose upon themselves the great sacrifice of deferring the publication of a description of a species or of a more important scientific discovery.

It is fitting, and we make it a duty to ourselves, to signalize the case of one of our most distinguished collaborators, Dr. F. Ris, of Rheinau. The printing of his masterly work on the Libellulinae was completed in 1916 and the last fasciculus could only be distributed today, March 1, 1919. Many descriptions of new species have lost priority by the fact of this delay. We think that there is ground for establishing the rights of Dr. Ris in certain cases and we beg our colleagues to examine them and to act toward him in all equity, now that the quite exceptional cause of the delay is known to all.—G. Severin, Conservator at the Musée Royal d'Histoire Naturelle de Belgique. [Translated.]

Abundance of Cicadas in Beluchistan.

Apropos of the present year as a 17-year Cicada year the following: "At Quetta, from the 15th to the end of June, 1918, there was a regular plague of Cicadas. A certain road, running out of Quetta for about five miles, was lined with small mulberry and a few willow and other trees. The trunks and branches of these trees were so closely studded with the Cicadas that they appeared gnarled and discolored. When a motor car passed along the road the insects continually rose in a swarm, resembling a swarm of large bees. The ground on either side of the road was pitted with the holes of the pupae, and the empty pupal cases clung in dozens to every plant and shrub. In the evening the noise near the trees was deafening. The imagines were about two inches long, colored yellow with red markings, but unfortunately I was unable to identify the species. On being disturbed they squirted a clear white fluid from the abdomen. If a drop of this entered the eye it caused smarting and irritation. In spite of this dogs, cats and chickens all eat them with relish. At about the end of June they began to die off and the ground under the trees was littered with their bodies. Some of the smaller trees were so damaged by their attacks that they lost their leaves.—F. B. Scott in Entom., London, April, 1919.

Changes of Address.

Charles W. Leng, Secretary of the New York Entomological Society and Research Associate in the American Museum of Natural History, has been appointed Director of the Museum of the Staten Island Institute of Arts and Sciences.

Edmund H. Gibson has resigned his position with the U. S. Bureau of Entomology and is entering upon a new field of endeavor for himself. Believing that entomology can be put on a dignified professional business basis the same as law, medicine, engineering, etc., he is taking the initial step and believes that after a certain amount of pioneering work the field should open up to other entomologists. Mr. Gibson's headquarters, for the time being, will be Alexandria, Virginia. His professional card is worded "Consulting Entomologist and Agricultural Engineer."

Prof. Bruner's Retirement.

Prof. Lawrence Bruner, eminent for his work on Orthoptera of North, Central and South America, has retired from active charge of the department of entomology in the University of Nebraska, according to *Science* for August 30, 1919. Myron H. Swenk succeeds him in this office and in that of State Entomologist.

Memorials to the late F. D. Godman.

Memorials in the form of a bronze tablet, with medallion portraits of Dr. Godman and his lifelong associate, Osbert Salvin, to be placed in the Natural History Museum at South Kensington, and of a "Godman Memorial Exploration Fund" are planned, according to the same number of *Science*. The initiative for the tablet is due to a committee of which Lord Rothschild is chairman; the Fund has its beginning in an offer of £5000 from Dame Alice Godman and her two daughters. Contributions received by the Committee over and above the amount required for the tablet will be added to the exploration fund.

The committee will welcome the co-operation of Americans. Contributions should be sent to Mr. C. E. Fagan, honorary treasurer, Godman Memorial Fund, Natural History Museum, Cromwell Road, London, S. W. 7.

Notes on the Occurrence of Schizax senex in California (Col., Cerambycidae).

The fascination of the deserts of Southern California which leads visitors to her grim fastnesses to a longing to return again and again, is particularly strong to the entomologist who revels in the strange fauna as well as the glowing sunsets with their ever changing colors and mysterious shadows. Like the prospecting "desert rat," who fares forth in search of mineral wealth, the collector of insects is constantly buoyed up by the hope of a lucky strike. New species may be found and rare treasures of insect life lure one back to another camp in some still unexplored canyon.

From the glowing coals of a mesquite camp fire near Palm Springs I was led to the discovery of a rare cerambycid which I do not find

recorded from California previously. Large brush piles furnished a plentiful supply of fuel and led me to take a few sticks home to try its burning qualities in a stove. These sticks laid in the wood shed until December, when I tried splitting one of the sticks and greatly to my surprise found neatly packed away in a cell next to the outer bark a beetle new to my experience. This stranger turned out to be *Schizax senex* Lec., previously recorded from Arizona.

The galleries and cells of *Schizax* were most numerous in the limbs ranging in size from one-half to one inch in diameter. The cells were very little larger than the gallery and extended to the thin outer bark. In December there were both pupae and adults in the cells, but in February all were adults fully matured and with normal coloring.

Other mesquite brush heaps of the same age about four miles distant showed no signs of *Schizax* borings, though the first pile yielded about fifty pairs. From the above I am inclined to think that this beetle is local in occurrence.

From some of these infested boughs which I took home and placed in a cage (home was then in Pasadena) the beetles emerged from March 3 to 25.—J. O. MARTIN, Berkeley, California.

Entomological Literature.

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded.

The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of papers containing new genera or species occurring north of Mexico are all grouped at the end of each Order of which they treat.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A. London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

4—Canadian Entomologist, London, Canada. **5**—Psyche, Cambridge, Mass. **7**—Annals of The Entomological Society of America, Columbus, Ohio. **9**—The Entomologist, London. **12**—Journal of Economic Entomology, Concord, N. H. **13**—Journal of Entomology and Zoology, Claremont, Calif. **16**—The Lepidopterist, Salem, Mass. **17**—Lepidoptera, Boston, Mass. **20**—Bulletin de la Societe Entomologique de France, Paris. **21**—The Entomologist's Record, London. **33**—Annales de la Societe Entomologique de Belgique, Brussels. **34**—Bulletin de la Societe Entomologique de Belgique, Brussels. **35**—Proceedings of the South London Ento-

mological & Natural History Society, London. **36**—Transactions of the Entomological Society of London. **50**—Proceedings of the United States National Museum, Washington. **52**—Zoologischer Anzeiger, Leipsic. **54**—Proceedings of the Biological Society of Washington, D. C. **68**—Science, Lancaster, Pa. **71**—Novitates Zoologicae, Tring, Englanad. **76**—Nature, London. **77**—Comptes Rendus des Seances de la Societe de Biologie, Paris. **78**—Bulletin Biologique de la France et de la Belgique, Paris. **82**—The Ohio Journal of Science, Columbus. **98**—Annals of Tropical Medicine and Parasitology, Liverpool. **99**—Bulletin du Museum National d'Histoire Naturelle, Paris.

GENERAL. Cockayne, E. A.—The relation between the secondary sexual characters and the gonads and accessory sexual glands in insects. **36**, 1916, 336-42. **Cockerell, T. D. A.**—The variations of insects. **4**, 1919, 121-3. **Collinge, W. E.**—Wild birds and distasteful insect larvae. **76**, ciii, 404, 483. **Crampton, G. C.**—A phylogenetic study of the mesothoracic terga and wing bases in Hymenoptera, Neuroptera, etc. **5**, xxvi, 58-64. **Escherich, K.**—Zeitschrift fur angewandte entomologie, IV, Heft 3. **Ford, H. D.**—Mould on insects. **9**, 1919, 167. **Krecker, F. H.**—The fauna of rock bottom ponds. **82**, xix, 427-74. **Labitte, A.**—Resistance vitale de quelques larves d'insectes. **99**, 1917, 399-400. **Moignic & Norero**—Recherches sur la distribution dans le poumon des huiles injectees par la trachee. **77**, lxxxii, 1002-4. **Rabaud, E.**—L'immobilisation reflexe et l'activite normale des arthropodes. **78**, liii, 1-149. **Rothschild, L.**—On the naming of local races, subspecies, aberrations, seasonal forms, etc. **36**, 1918, 115-16. **Schunk, C. A.**—Formaldehyde for "mould" on insects. **9**, 1919, 137-8. **Speyer, E. R.**—Wild birds and distasteful insect larvae. **76**, ciii, 445-6.

PHYSIOLOGY, GENETICS, ETC. Bridges & Mohr—The inheritance of the mutant character "Vortex" (Genetics, iv, 283-306). **Gowen, J. W.**—A biometrical study of crossing over . . . in the third chromosome of Drosophila (Genetics, iv, 205-250). **Mohr, O. L.**—Character changes caused by mutation of an entire region of a chromosome in Drosophila (Genetics, iv, 275-282).

ARACHNIDA & MYRIAPODA. Brolemann, H. W.—Quelques indices d'evolution chez les Myriapodes (Trav. Inst. Zool. Univ. Montpellier, Mem. No. 28). **Clayton, F.**—Mimicry in spiders (Jour. Bombay Nat. Hist. Soc., xxvi, 302-3). **Houssay, B. A.**—Action physiologique du venin des scorpions (Buthus quinquestriatus et Tityus bahiensis) (Jour. Phys. Path. Gen. xviii, 305-317). **Leitao, M.**—Drassodeas do Brasil (Arch. Escola Sup. Agr. Med. Veter., Nictheroy, E. do Rio, Brazil, ii, 17-75).

NEUROPTERA. **Butterfield, W. R.**—Note on Protura and how to collect them (The Museum Journal, xviii, 196-7). **Longinus Navas, R. P.**—Insecta nova [Neotropical] (Mem. Pont. Ac. Rom. d. Nuovi Lincei, iii, 1-22). **Howe, R. H.**—A list of dragon-flies collected at Wareham, Mass., during 1911-1913. **5,** xxvi, 65-8. **Rothschild, N. C.**—Convergent development among certain ectoparasites. **36,** 1916, cxli-clvi. **Morrison, E. R.**—The may-fly ovipositor, with notes on Leptophlebia and Hagenulus. **4,** 1919, 139-46.

ORTHOPTERA. **Chopard, L.**—Diagnoses d'especes nouvelles d'Orthopteres [Neotropical]. **20,** 1919, 153-4. **DuPorte, E. M.**—The propleura and the pronotal sulci of the O. **4,** 1919, 147-53. **de Kelper, W.**—Causerie sur le grillon champetre. **34,** i, 38-47. **Labitte, A.**—Une extraordinaire aberration genitale d'un orthoptere acridide, le Pamphagnus numidicus. **99,** 1917, 401. **Roth, H. L.**—Observations on the growth and habits of the stick insect, Carausius morosus; intended as a contribution towards a knowledge of variation . . . . **36,** 1916, 345-86. **Walker, E. M.**—On the male and immature state of Grylloblatta campodeiformis. **4,** 1919, 131-9.

HEMIPTERA. **Drake, C. J.**—On some Tingidae new to the fauna of Canada. **4,** 1919, 159-60. **Moore & Hirschfelder**—An investigation of the louse problem (Pediculus corporis). (Res. Pub., Univ. of Minnesota, viii, No. 4.) **Peterson, A.**—Some studies on the eggs of important apple plant lice (New Jersey Ag. Exp. Sta., Bul. 332). **Stoll & Shull**—Sex determination in the white fly (Genetics, iv, 251-260). **Strindberg, H.**—Zur entwicklungsgeschichte der oviparen cocciden. **52,** 1, 113-138.

Drake, C. J.—On some N. A. Tingidae. **82,** xix, 417-21. **Hart, C. A.**—The Pentatomoidea of Illinois with keys to the Nearctic genera. (Illinois Nat. Hist. Survey, Bul. xiii, 157-223.) **McAtee, W. L.**—A new genus for Tettigonia trifasciata (Eupterygidae). **54,** xxxii, 121-4.

LEPIDOPTERA. **Beutenmuller, W.**—Catocala aspasia and varieties. The larva of Melipotis jucunda. **16,** iii, 110; 111. **Burke, H. E.**—Notes on the California oak worm, Phryganidia californica. **10,** xxi, 124-5. **Burrows, C. R. N.**—Dwarf lepidoptera. **21,** 1919, 89-90. **Busck, A.**—A microlepidopteron injurious to Avocado. **10,** xxi, 125-6. **Buxton, P. A.**—On the protocerebrum of Micropteryx. **36,** 1917, 112-53. **Chapman, T. A.**—The rein-sheath in Plebeiid blues. Resting attitudes in some L., examples of recapitulation in habit. Micropteryx entitled to ordinal rank; Order

Zeugloptera. The evolution of the habits of the larva of Lycaena arion. **36,** 1916, 297-300; 301-9; 310-14; 315-21. Further notes on recapitulatory attitudes in L. **36,** 1917, 338-48. **Cockayne, E. A.**—Gynandromorphous Agriades coridon, A. coridon ab roystonensis. Gynandromorphous L. **36,** 1916, 243-63; 322-35. Condition of the scales in the leaden males of Agriades thetis and other Lycaenids. **36,** 1917, 165-8. **Comstock, J. A.**—Collecting in the Tehachapis. **16,** iii, 112 (cont.). **da Costa Lima, A.**—Nota sobre o microlepidoptero Pyroderces rileyi. (Arch. Escola Sup. Agr. Med. Veter., Nictheroy, E. do Rio, Brazil, ii, 75-8.) **Dodge, E. A.**—Catocala notes. **17,** iii, 54. **Durrant, J. H.**—Collation of the corrected genera of the Tantamen and "Verzeichniss bekannter Schmetterlinge" of J. Hubner. (Sep. of Ent. Record, xxxi, No. 5.) **Ehrmann, G. A.**—Collecting in a silent city. **17,** iii, 51. **French, G. A.**—Catocala ulalume, a correction. **4,** 1919, 130. **Gautier, C.**—Recherches physiologiques et parasilologiques sur les lepidopteres nuisibles. Parthenogenese chez Apanteles glomerutus. **77,** lxxxii, 1000 2. **Hewlett, E. P.**—Notes on Samia rubra. **17,** iii, 50-1. **Joicey, J. J.**—On a collection of Heliconine forms from French Guiana. **36,** 1916, 412-31. **Joicey & Kaye**—Notes on a large Heliconine collection made in French Guiana in 1917. **36,** 1918, 347-53. **McIndoo, N. E.**—The olfactory sense of lepidopterous larvae. **7,** xii, 65-84. **Merritt Hawkes, O. A.**—On the factors which determine the cocoon colour of Plusia moneta and other L. **36,** 1916, 404-11. **Meyrick, E.**—Descriptions of So. Am. Micro-L. **36,** 1917, 1-52. **Mosher, E.**—Notes on lepidopterous borers found in plants, with special reference to the European corn borer. **12,** xii, 258-68. **Reiff, W.**—Notes on [Marumba modesta, Callosamia calleta, Cethosia hypsina]. **17,** iii, 52-3. **Rothschild, L.**—Supplementary notes on the review of Houlbert and Oberthur's monograph of Castniinae, by Talbot and Prout. List of types of L. in the Tring Museum. **71,** xxvi, 1-27; 193-251. **Sich, A.**—A beginner's remarks on the Tortricina. **35,** 1918-19, 11-14. **Smulyan, M. T.**—Some observations on the webbing clothes moth (Tineola biselliella). **5,** xxvi, 71-3. **Talbot, G.**—Review of a monograph of the "Castniinae." **71,** xxvi, 28-35. **Traver, J. R.**—Ecological relations of the lepidopterous genus Depressaria. **5,** xxvi, 73-80. **Turati, C. E.**—Variabilita del Parnassius apollo pumilus. E ricerche sull'origine dei Parnassius. (Atti Soc. Italiana, Sci. Nat. . . . Milano, lvii, 29-89.) **Turner, A. J.**—Observations on the lepidopterous family Cossidae, and on the classification of the L. **36,** 1918, 155-90.

Swett & Cassino—Some new Geometrids. **16,** iii, 105-10.

DIPTERA. **Cockerell, T. D. A.**—Glossina and the extinction of tertiary mammals. **76**, ciii, 265. **Evans, A. M.**—On the genital armature of the female tsetse-flies (Glossina). **98**, xiii, 31-56. **Hawley, I. M.**—A note on temperature in relation to Sciara coprophila. **12**, xii, 271. **Lamb, C. G.**—Falkland Islands D. **36**, 1916, 387-95. **McColloch, J. W.**—Variations in the length of the flaxseed stage of the hessian fly. **12**, xii, 252-5. **Metcalf, C. L.**—A proposed nomenclature for the parts of the posterior respiratory apparatus of dipterous larvae . . . **5**, xxvi, 54-8. **Weiss, H. B.**—Notes on the early stages and larval locomotion of Leia vivittata. **5**, xxvi, 80-2.

Dietz, W. G.—The Streptocera group of the dipterous genus Tipula. **7**, xi, 85-94. **Greene, C. T.**—A new genus in Scatophagidae. **10**, xxi, 126-9. **Hine, J. S.**—Robber flies of the genus Erax. **7**, xi, 103-58. **Malloch, J. R.**—Two new N. A. Anthomyiidae. **54**, xxxii, 133-4. **Parker, R. R.**—North American Sarcophagidae: Flies of the genus Metoposarcophaga. **4**, 1919, 154-8.

COLEOPTERA. **Blatchley, W. S.**—Change of name (Serica carinata Blatch. to S. evidens n. n.). **4**, 1919, 153. **Bordas, L.**—Nouvelles observations sur l'appareil digestif des Cetoninae. (Bul. Soc. Zool. France, Paris, xlii, 7-12.). **Bugnion, E.**—Le ver luisant provencal. **77**, lxxxii, 994-99. **Burke, H. E.**—Notes on a cocoon making Colydiid. **10**, xxi, 123-4. **Champion, G. C.**—On new and little-known Lagriidae and Pedilidae [some neotropical]. **36**, 1916, 181-242. On new and little known Lagriidae from Tropical America. **36**, 1917, 169-267. **Claassen, P. W.**—Life history and biological notes on Chlaenius impunctifrons (Carabidae). **7**, xi, 95-102. **Dury, C.**—A new Ciside genus with n. sp. from Manitoba. **4**, 1919, 158. **Kerremans, C.**—Descriptions de Buprestides nouveaux [neotropical in part]. **33**, lix, 41-62. **Mellerio, A.**—Observations biologiques faites sur quelques insectes coleopteres. **99**, 1918, 418-19. **Muir, F.**—Notes on the ontogeny and morphology of the male genital tube in C. **36**, 1918, 223-29. **Peschet, R.**—Description d'un Dytiscidae nouveau de l'Amerique du Sud. **20**, 1919, 145-7. **Pic, M.**—Nouveaux C. exotiques [Neotropical in part]. **99**, 1917, 258-63. **Sharp, D.**—Studies in Rhynchophora. IV. A preliminary note on the male genitalia. **36**, 1918, 209-22. **Tower, W. L.**—Mechanism of evolution in Leptinotarsa. (Carnegie Inst. Wash., Pub. No. 263, 382 pp.).

HYMENOPTERA. **Bodkin, G. E.**—Notes on some British Guiana H. (exclusive of the Formicidae). **36**, 1917, 297-321. **Brues, C. T.**—Note on the genus Liobracon, with the description of a n.

sp. [Neotropical]. **5,** xxvi, 68-71. **Cockerell, T. D. A.**—The antiquity of the Ichneumonidae. **9,** 1919, 121-2. **Crampton, G. C.**—The genitalia and terminal abdominal structures of males, and the terminal abdominal structures of the larvae of "Chalastogastrous" Hymenoptera. **10,** xxi, 129-55. **Lichtenstein & Picard**—Etude morphologique et biologique du Sycosoter lavagnei. Hecabolide parasite de l'Hypoborus ficus. (Trav. Inst. Zool. Univ. Montpellier, Mem. No. 29.). **Morice & Durrant**—Further notes on the "Jurinean" genera of H., . . . **36,** 1916, 432-42. **Reymond, R. B.**—Ueber den gang mit kunstlichen beinen. (Archiv. f. Anat. u. Phys., 1917, Phys. Abt., 222-244.). **Rohwer, S. A.**—Description of a new Cynipoid from Trinidad. **10,** xxi, 156. **Sladen, F. W. L.**—Notes on the Canadian representatives of British species of bees. **4,** 1919, 124-30. The stinging instinct in bees and wasps. **76,** ciii, 325. **Turner, R. E.**—New sp. of H. in the British Museum [some Neotropical]. **36,** 1917, 53-84. **Wheeler, W. H.**—[List of the] ants from the Claremont laguna region. **13,** xi, 38.

Cushman, R. A.—Descriptions of new No. Am. Ichneumon-flies. 50, lv, 517-43. **Gahan, A. B.**—Some chalcid wasps reared from cecidomyid galls. **7,** xi, 159-70. A new sp. of the Serphidoid genus Dendrocerus. **10,** xxi, 121-3. **Rohwer, S. A.**—Descriptions of four new parasitic H. **4,** 1919, 160-2.

REPORT OF THE IMPERIAL ENTOMOLOGIST, 1917-1918. By T. BAINBRIGGE FLETCHER. Calcutta, Supt. Gov't. Printing, India, 1918. (From Scientific Repts. Agr. Res. Inst., Pusa, 1917-18, pp. 84-116, pls. iii-xx.) —In addition to dealing with the insect pests of cotton, rice, sugarcane, indigo, mulberry, fruit, stored grain, wood and lantana, with insecticides, bees, lac and silk, this report tells a familiar story of insufficient assistance and funds, of growing collections and the difficulty of caring for them. The definitely named species in the collection at Pusa have increased from 2221 in 1908 to 6471 in 1918, the Lepidoptera and Coleoptera heading the list in point of numbers.

STUDIES ON THE FRUIT-FLIES OF JAPAN. I. JAPANESE ORANGE-FLY, by Dr. TSUNEKATA MIYAKE Government Entomologist. (From Bulletin Imp. Cent. Agr. Exper. Sta. Japan, II, 2, pp. 85-165, pls. ii-x.) Nishigahara, Tokyo, Feb., 1919.—An elaborate account of the external and internal structure of the various stages of *Dacus tsunconis* n. sp. (*D. ferrugineus* Kuwana, nec Fabricius), its life history and habits, the methods of control, and descriptions of five other new Japanese species of Trypaneidae. The beautiful plates illustrate all of these topics.

Doings of Societies.

Feldman Collecting Social.

Meeting held April 16, 1919, at the residence of H. W. Wenzel, 5614 Stewart Street, Philadelphia. Seven members present, Pres. H. W. Wenzel in the chair.

Mr. Ernest Baylis, of Frankford, Philadelphia, Pennsylvania, was elected a member.

Diptera. Mr. Hornig said that *Aëdes canadensis* Theob. is now on the wing, taking at this time of the year 31 days to mature from the egg, while at the height of the season it will take about 11 days.

Coleoptera. Mr. Geo. M. Greene recorded seeing *Hydrous triangularis* Say at light during the evening of April 8th, and the next day *Creophilus villosus* Grav. and *Platynus cupripennis* Say on the sidewalk. Mr. H. W. Wenzel mentioned some new varieties of *Cychrus* lately named, after which there was a general discussion on the genus. Mr. H. A. Wenzel exhibited a large series of *Hylecoetes lugubris* Say which he had collected at West Overbrook, Pennsylvania, IV-13 and 14 in a poplar log which he supposed had been dead about a year. The bark was slightly loose and in the sap beneath had found the beetles, just ready to emerge. They bore in the wood similarly to Scolytids, but one peculiarity was noted on the specimens of the wood shown—it is vertically grooved and ridged alternately and all the beetles had emerged (as far as they had gone when found) through the ridges and none in the grooves, though by coming through the latter they would have had less wood to bore through. The sexes are quite unlike and the males have wonderfully feathered palpi which are much larger than the antennae—GEORGE M. GREENE, *Secretary*.

Meeting of May 21, 1919, at the same place. Ten members were present, Dr. J. C. Bradley, of Cornell University, and Mr. John H. Hodgins, of this city, visitors. President H. W. Wenzel in the chair.

Dr. Bradley detailed collecting trips he had taken to the cañons of the Colorado Desert, Southern California, in December, 1917, and March, 1918.

Coleoptera. Dr. Castle read a letter from Mr. Leng, dated April 7, saying he had seen the records in the minutes of the January meeting, published in Ent. News xxx, p. 120, 1919, relative to *Scaphinotus ridingsii* Bland. He enclosed a separate in which he described this form which should be *S. ridingsii monongahelae* Leng. Dr. Castle also had a newspaper clipping from "The San Francisco Examiner," March 16, 1919, on "Experts hunt winter home of ladybirds," in which was described the manner of collecting the Coccinellids in winter time after they hibernate in great numbers under the pine needles at the snow line in the mountains of California. These are placed in cold storage and later liberated in the orange groves to destroy the aphids

upon which they feed. Mr. Hornig said since catching *Carabus nemoralis* Mull. in Germantown, Philadelphia, he buried on May 16th a saucer containing molasses in his yard and the next morning had one specimen and since then has taken some each day. Mr. H. W. Wenzel said, in continuation of his son's communication of last meeting on *Hylecoetus lugubris* Say, that his specimens were found just emerging on April 13th and 14th, and Say in his description of this species says it was caught flying in the vicinity of New Harmony, Indiana, on April 16th. Mr. Geo. M. Greene exhibited *Liodes basalis* LeC. from Wissahickon Creek at Chestnut Hill, Philadelphia, V-19-'19, from decayed wood, *Exomius pellucidus* Boh., same place and date, running on the ground, and *Hoplia trifasciata* Say (all males), same place, V-14-'19, on nettle and specimens of the last species from Falls Church, Virginia, V-20-'17 (also all males).

Diptera. Mr. Hornig stated that he had recorded *Aëdes curriei* Coq. as new to this locality and now it has almost disappeared and in its place is *A. onondagensis* Knab and Dyar; the imagoes are difficult to distinguish, but the larvae are very different. Mr. Geo. M. Greene exhibited *Strauzia longipennis* Wied. from Wissahickon Creek at Chestnut Hill, Philadelphia, V-14 and V-19-'19.

Hymenoptera. Mr. Baylis exhibited a specimen of *Vespa crabro* Linn. which he had found dead at Frankford, Philadelphia, V-18-'19.

Lepidoptera. Mr. Geo. M. Greene recorded *Anthocharis genutia* Fabr., both sexes, common, flying along the Wissahickon Creek at Germantown, Philadelphia, V-5-'19.—GEO. M. GREENE, *Secretary.*

American Entomological Society.

Meeting of February 27, 1919, in the hall of The Academy of Natural Sciences of Philadelphia. Fifteen persons present, Vice-President Rehn presiding.

Coleoptera. Mr. Laurent exhibited *Alaus oculatus* Linn. and full grown larva of same, the latter taken from the roots of common silver maple at Mt. Airy, Philadelphia, Pa., February 12th. Stated that he has taken imagoes of this species in May, June, July and August.

Lepidoptera. Mr. Baylis exhibited an odd light form of *Melitaea phaeton* Drury which he collected in Philadelphia, June 29, 1918. The differences from the common type are more noticeable on the under side of the hind wings.

Diptera. Mr. Baylis exhibited a Tipulid which had been impressed in paper apparently when the paper was made. Mr. Hornig said he had seen *Chironomus* flying yesterday over water in Germantown, Philadelphia.

Orthoptera. Mr. Rehn made some remarks on the Acridid genus *Derotmema* which he had been studying. The speaker discussed the area of distribution of the genus, the various forms, and the charac-

ters of chief use in separating them, as well as their respective areas of distribution and some of the questions of synonymy involved. The results of his work have been reached after examining over eight hundred specimens of the genus. The distributions were shown by means of a blackboard sketch and their habitats by lantern slides.

General. Mr. Cresson exhibited a copy of Say's "American Entomology," his first attempt, published in 1817, containing six plates. There is only one other copy known. The regular edition of this work is dated 1824. Also a copy of Say's "Descriptions of new species of North American Insects," most of which had previously been published in the Disseminator.

Meeting of April 24, 1919, in the same place; ten persons present, President Dr. Skinner presiding.

Mr. W. J. Coxey, of Camden, New Jersey, was elected a member.

Orthoptera. Mr. Rehn made some remarks, illustrated by specimens and a map, on the distribution of certain species and races of the genera *Mestobregma* and *Metator*. The effectiveness of the Rocky Mountains as a barrier in controlling the distribution of insects was discussed.

Diptera. Mr. Geo. M. Greene recorded seeing a specimen of *Callicera johnsoni* Hunter flying in West Fairmount Park, Philadelphia, in the morning of April 21st.—Geo. M. Greene, *Recording Secretary.*

Entomological Section, Academy of Natural Sciences of Philadelphia.

Meeting of March 27, 1919, nine persons present; in the absence of the Director and Vice-Director Dr. Skinner presided.

W. J. Coxey, of Camden, New Jersey, and R. L. Haines, of Moorestown, New Jersey, were elected member and contributor respectively.

Lepidoptera. Mr. West exhibited the larvae of *Catocala relicta* Wlk. from Philadelphia, VI-30-'13, and *C. aspasia Streck.* from Philadelphia, VI-21-'13. Dr. Skinner remarked on the genus saying many people had been interested in it and had bred the species and lately the interest has been renewed by the memoir published by the American Museum of Natural History; he expects that the various forms will finally be placed in the near future. Dr. Skinner exhibited *Pyrameis carye* Hübn. and the aberration *muelleri* Letch., the latter collected at Los Angeles, California, VII-6-'13, by V. Duran; also an aberration of *Argynnis myrina* Cram. from Glenside, Pennsylvania, and a peculiar ♀ of *Colias eurydice* Boisd. from Topango Canyon, Los Angeles County, California, VIII-6-'14, collected by V. Duran.

General. Mr. Rehn exhibited the differences between the German Zeiss binocular microscope (duplicated in America by the Bausch and Lomb Co.) and the American Spencer, saying the latter is the more satisfactory and far superior to the other.—Geo. M. Greene, *Recorder.*

TO STUDENTS
OF NORTH AMERICAN COLEOPTERA

Realizing the great desire of all students of our Beetles to possess the various papers of Dr. Le Conte, F. E. Melsheimer, S. S. Haldeman, W. F. Rogers, P. R. Uhler, and D. Ziegler, originally published in the now almost unobtainable Volumes 1-8 of Proceedings of Academy of Natural Sciences of Philadelphia, 1843 to 1856, Mr. Laurence R. Reynolds and Mr. Sherman are considering the reprinting of these papers on Coleoptera, 58 titles in all, embracing about 500 pages of text with 2 plates. The eight complete volumes in question would easily bring $100.00 if they could be obtained by themselves.

It is proposed to furnish the above articles on Coleoptera in about 30 separate papers, preserving the original pagination, with date and place of publication on each. The important Melsheimer descriptions of some 600 new species presented in seven different issues, of Volumes 2 and 3, and which were never issued as author's separates, will be printed in one paper of about 132 pages, with separate cover.

In addition to the papers from these eight volumes of the Proceedings of the Philadelphia Academy, there will be included in this collection reprints of Dr. Le Conte's second paper on N. A. Coleoptera —"Some new and interesting Insects inhabiting the United States." 7 pages and plate, originally published in Boston Journal of Natural History, 1844, and of the same writer's "Remarks on the Coleoptera of Lake Superior" (1850, with 44 pages and plate) and "List of the Coleoptera of Vancouver Island" (1869, 17 pages). No author's separates of either of the last two papers were distributed, while both are very valuable and important in taxonomic studies.

Provided 50 subscriptions for the above series of reprints, *at* $25.00 *per set, can be secured*, Mr. Sherman will proceed at once with this undertaking. There is little doubt that at least this number of subscriptions will be forthcoming, but in case they are not secured by November 1, 1919, all money will be returned on that date.

In PRESS

The North American Species of Coelambus

By H. C. Fall

A full account of our species of this difficult genus with synoptic table of the 37 species, of which 14 are described for the first time.

Price $1.00

All subscriptions and remittances for above reprints and for Dr. Fall's paper should be sent promptly to

JOHN D. SHERMAN, JR.,

24 Claremont Ave., Mount Vernon, New York

The present opportunity is taken advantage of by Mr. Sherman to state that Mr. Leng's "LIST OF THE COLEOPTERA OF NORTH AMERICA," now in the printer's hands, will in all probability be issued before December 1, 1919. Price $7.50, unbound.

NEW ARRIVALS

From Columbia, So. America:

OVER 10,000 BUTTERFLIES, INCLUDING

Morpho cypris
" sulkowskyi
Morpho amathonte
Caligo spp.

From Cuba:

1500 BUTTERFLIES AND MOTHS, INCLUDING

Papilio columbus
" andraemon
" celadon
" devilliersi
Urania boisduvali
Erinyis guttalaris
Protoparce brontes, etc.

From Venezuela:

Over 5000 Lepidoptera
200 Dynastes hercules

From New Guinea:

2000 Coleoptera
200 Orthoptera

From Assam, India:

1200 BUTTERFLIES AND MOTHS, INCLUDING

Papilio arcturus
" philoxenus
Kallima inachis
Brahmaea wallachi

And Many Other Showy Species

From Tibet (Bhutan)

Armandia lidderdalii
Parnassius hardwicki

CATALOGUES OF ENTOMOLOGICAL SUPPLIES AND SPECIMENS ON APPLICATION

If interested kindly send your list of desiderata for further information to

THE KNY-SCHEERER CORPORATION

Department of Natural Science
G. Lagai, Ph.D.

New York
404-410 W. 27th Street

NOVEMBER, 1919.

ENTOMOLOGICAL NEWS

Vol. XXX. No. 9

Thaddeus William Harris
1795-1856.

Smithsonian Institution
NOV 10 1919
National Museum

PHILIP P. CALVERT, Ph.D., Editor.
E. T. CRESSON, Jr., Associate Editor.
HENRY SKINNER, M.D., Sc.D., Editor Emeritus.

ADVISORY COMMITTEE:

EZRA T. CRESSON, PHILIP LAURENT, GEORGE M. GREENE, J. A. G. REHN, H. W. WENZEL.

PHILADELPHIA:
THE ACADEMY OF NATURAL SCIENCES,
LOGAN SQUARE.

Entered at the Philadelphia Post-Office as Second-Class Matter.
Acceptance for mailing at the special rate of postage provided in Section 1103,
Act of October 3, 1917, authorized on July 19, 1918.

ENTOMOLOGICAL NEWS

published monthly, **excepting August and September**, in charge of the Entomological Section of The Academy of Natural Sciences, Philadelphia, and The American Entomological Society.

ANNUAL SUBSCRIPTION, $2.00 IN ADVANCE.

SINGLE COPIES 24 CENTS.

ADVERTISING RATES: Full width of page. Payments in advance.

One issue,	one inch,	$ 1.20,	two inches,	$ 2.40,	half page,	$ 4.00,	full page,	$ 8.00
Five issues,	"	5.50,	"	11.00,	"	17.50,	"	35.00
Ten issues	"	11.00,	"	20.00,	"	35.00,	"	70.00

☞ All remittances, and communications regarding subscriptions, non-receipt of the NEWS or of reprints, and requests for sample copies, should be addressed to ENTOMOLOGICAL NEWS, 1900 Race Street, Philadelphia, Pa. *All Checks and Money Orders to be made payable to the* ENTOMOLOGICAL NEWS.

☞ All complaints regarding non-receipt of issues of the NEWS should be presented within three months from date of mailing of the issue. After that time the numbers will be furnished only at the regular rate for single copies.

☞ Not more than two issues will be replaced gratis through loss, in transit or in change of address, unless such have been registered, at the subscriber's expense.

☞ Address all other communications to the editor, Dr. P. P. Calvert, Zoological Laboratory, University of Pennsylvania, Philadelphia, Pa., from September 15th to June 15th, or at the Academy of Natural Sciences, from June 15th to September 15th.

TO CONTRIBUTORS.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" for each number into the hands of the printer five weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form and without covers, will be given free, when they are wanted; if more than twenty-five copies are desired, this should be stated on the MS. The receipt of all papers will be acknowledged. Proof will be sent to authors for correction only when specially requested.

SPECIAL NOTICE TO AUTHORS

Owing to increased cost of labor and materials, no illustrations will be published in the NEWS during 1919, except where authors furnish the necessary blocks, or pay in advance the cost of making blocks and pay for the cost of printing plates. Information as to the cost will be furnished in each case on application to the Editor. Blocks furnished or paid for by authors will, of course, be returned to authors, after publication, if desired.

☞ The printer of the NEWS will furnish reprints of articles over and above the twenty-five given free at the following rates: Each printed page or fraction thereof, twenty-five copies, 15 cents; each half tone plate, twenty-five copies, 20 cents; each plate of line cuts, twenty-five copies, 15 cents; greater numbers of copies will be at the corresponding multiples of these rates.

500 PIN-LABELS, 25 CENTS! All Alike on a Strip.

Smallest Type. Pure White Ledger Paper. Not Over 4 Lines or 30 Characters (13 to a Line). Additional characters 1c. each. per Line, per 500, Trimmed.

C. V. BLACKBURN, 12 Pine St., STONEHAM, MASS., U. S. A.

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

THE ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XXX. NOVEMBER, 1919. No. 9.

CONTENTS:

Van Dyke—A few Observations on the Tendency of Insects to Collect on Ridges and Mountain Snowfields.. 241
Barnes and Lindsey—A New Geometrid from Arizona (Lepid.)..... 245
McAtee—Notes on two Miridae, Camptobrochis and Paracalocoris (Het.) 246
Skinner—An Interesting Gynandromorphic Butterfly (Lepid., Rhop.) 247
Van Duzee—Two New Asyndetus with a Table of the North American species (Dolichopodidae, Diptera).... 248
Chalcid Travels Through Blackbird (Hym.)..... 250
Weiss—Tinea cloacella Haworth bred from Fungi (Lepid.)..... 251
Bryant—Richness of Borneo in Coleoptera..... 252
Goe—Life History and Habits of Silpha inaequalis Fab. (Coleop.)..... 253
Howard—On the Hymenopterous Parasites of Kermes (Hom., Coccidae) 255
Morrison—Appended Note to preceding..... 258
Braun—Notes on Cosmopterygidae, with Descriptions of new Genera and Species (Microlepidoptera)... 260
Editorial—The Use of the Term Larva 265
Entomological Literature..... 266
Moore and Hirschfelder—An Investigation of the Louse Problem..... 270
Ruggles—Seventeenth Report of the State Entomologist of Minnesota.. 270

A few Observations on the Tendency of Insects to Collect on Ridges and Mountain Snowfields.

By EDWIN C. VAN DYKE, Berkeley, California.

The article on the insect life of high altitudes,* recently contributed to this journal by Dr. L. O. Howard, has tempted me to add a few more notes on the same subject from my own field experiences.

While collecting in the high Cascades and Sierra Nevadas, I have found at times, particularly during the early summer when insect life was most abundant, that my most profitable work could be done above the normal line of vegetation. On the snow fields insects were to be found either running over those portions adjacent to the bare rocks and ground or more or less widely scattered over the face of the ice at higher levels. On the bare peaks and rocky ridges other insects were also to be found.

* "A Note on Insects Found on Snow at High Elevations," by L. O. Howard, Entom. News, Vol. xxix, No. 10 (Dec., 1918), p. 375

On our higher mountains as well as in the far north the summer advances rapidly and insect life as a consequence appears with a rush. Insects will always be found following close upon the retreating snow. On the moist earth, just below the lower margins of the rapidly melting snow fields, numerous predaceous Coleoptera, such as the smaller Carabidae and Staphilinidae as well as small Diptera, can be found. These insects and numerous spiders become very active during the warmer parts of the day and their peregrinations are often extended during this time over the adjacent snowfields and sometimes for considerable distances. One summer I found certain species of *Platynus* and *Bembidium* so numerous along the lower margins of the snow on Mt. Lyell that I was kept busy for quite a time gathering them in. This same tendency of the smaller Coleoptera to run out over the snowfields was also noted later when on Mt. Rainier and on the mountains of the Aleutian Islands.

On the snowfields at higher levels, chiefly those on favorable exposures, other insects were to be noted. These were of miscellaneous types, such as are normally to be found flying about the trees and over the grassy slopes of the mountains at lower altitudes, and were no doubt carried upwards by the gradually rising currents of air. Becoming tired or somewhat chilled as they were wafted over the icy slopes, they were impelled to settle, when they soon became benumbed and ultimately frozen. On the west slopes of Mt. Rainier during the middle of July, 1905, I often amused myself by traveling over the lower snowfields looking for the unlucky derelicts. The insects which I found were of all orders, Hymenoptera, Diptera, Lepidoptera, Hemiptera and Coleoptera. Of the Hymenoptera I remember particularly the Ichneumonidae and Formicidae, particularly the large wood ants of the genus *Camponotus*. Of the Hemiptera I secured several Cicadidae, many Pentatomidae and Coreidae and noted remains of numerous Miridae, which last, because of their frail nature, had so rapidly disintegrated that they were not worth picking up. Of the Coleoptera there were many Cerambycidae, both day

and night-flying species, a few Buprestidae, numerous Chrysomelidae, Byrrhidae, Coccinellidae and Scarabaeidae, and some Elateridae, Rhynchophora and other miscellaneous groups. Some of the specimens were merely benumbed, others quite dead, while still others were badly disintegrated. The more recent arrivals were on the surface of the snow, but those which had been trapped earlier were sometimes several inches below the surface, at the bottom of small shafts, where the heat of their bodies, or the greater amount of heat attracted by their darker coloring, had caused them to be deposited by the more rapid melting of the snow in their immediate neighborhood. On the snowfields in the Sierras the same thing has been observed. In fact, so general is this condition during the early summer months that it is wise for collectors planning work in the high mountains to make arrangements to take advantage of this. One's eyes should always be protected by smoked glasses and the face blackened as the glare of the snow on bright days is very intense. The insects are very conspicuous against the white background, so are easily seen and besides contain many prizes. One may also often have the good fortune to appear upon the scene soon after a mountain storm, when the booty will sometimes be very great. These high winds sometimes lift up hosts of many of the more powerful flying insects and leave them chilled and stranded on the icy slopes of the higher mountains. The alpine butterfly, *Oeneis ivallda* Mead, has several times been found so distributed on the high mountains of the southern Sierras.

About the bare peaks and ridges insects are also quite evident. Here, however, they are alive and active. Certain kinds even seem to have a particular liking for such localities, as for instance among the Diptera, the Bombylidae, Syrphidae and Tachinidae. Among the butterflies several species have also been noted which seem to take delight in seeking the highest points of the ridges. *Papilio zolicaon* Boisd. is one of these, and the alpine species of *Pieris* also favor such places. The peaks are also favorite congregating regions for vast quantities of Coccinellidae, especially *Hippodamia 5-signata*

Kirby, though a few *Cocinella monticola* Muls. are often associated with them, and multitudes of the winged ants of the genus *Camponotus*. The lady beetles and the ants finally perish in such places and through the succeeding years often form considerable accumulations in the crevices of the rocks. This was noted on the summits of the Tatoosh Range in the Cascades, also on Mt. Tallac and other peaks of the Sierras. Though this tendency of the Coccinellidae to collect on the exposed peaks is injurious to their race and might be classed as a pathological condition, the beetles do have a normal congregating instinct which, when directed to more favorable localities, as in sheltered valleys and lower ranges, is a benefit. This normal habit of congregating for purposes of hibernating is however not peculiar to the lady beetles. Among the Coleoptera it is almost equally common among certain Chrysomelidae and Rhynchophora and is to be found also among the Hemiptera. In fact, the custom of certain species of Coccinellidae, Chrysomelidae and Rhynchophora to seek the uplands and tops of the lower ridges of certain parts of California as winter approaches has been so well known to certain entomologists that they purposely do much of their winter collecting in such places. In the clefts of the rocks along the crest of the San Bruno hills, which form the southern boundary of San Francisco County, we have often found during the winter months fair assemblages of such beetles as *Hippodamia convergens* Guer., *Disonycha maritima* Mann. and *Cassida nigripes* Oliv., and at the bases of the rocks *Notiophilus semiopacus* Esch. and *Amara aurata* Dej. Several of these are only to be found at other times of the year as isolated specimens and never on the ridges. On Mt. Tamalpais, just across the Golden Gate from San Francisco, winter colonies of *Phagiodera prasinella* Lec. and *Sitones sordidus* Lec. can always be found and I have noted various small colonies of similar beetles on the Berkeley hills as well as on the hills near Los Angeles. The list of species which congregate in various places for purposes of hibernation or aestivation is really quite extensive.

A New Geometrid from Arizona (Lepid.).

By Wm. Barnes, M.D. & A. W. Lindsey, Ph.D., Decatur, Illinois.

In the "Novitates Zoologicae" XXV, p. 376, under his new genus *Anurapteryx,* Sir George F. Hampson mentions an undescribed species of which Dr. McDunnough has informed him. The species is represented in the Barnes collection by two females, from which we have drawn up the following description.

Anurapteryx crenulata sp. nov.

Vestiture of head and thorax luteous with the scales dark gray near the tips. Front paler. Antennae brown with luteous scales above, powdered with gray scales and obscurely annulate toward base. Abdomen luteous, powdered with gray. Under surface similar.

Primaries above pinkish luteous with a broad transverse median band heavily powdered with dark gray scales, widest from cubitus to costa, constricted behind cubitus, and widened again just before inner margin. Outer margin of band scalloped, inner very indefinite. Basal area paler, powdered with gray. Median band followed by a narrow band of the ground color, which is the most conspicuous feature of the wing. This band shades into fuscous toward the s. t. line. There is a subterminal series of slightly paler lunules, outwardly edged with dark gray. Terminal area and fringes concolorous with lunules, cut by ground color at veins. Veins alternately marked with dark gray and pinkish luteous. Entire wing with obscure, slender, powdery, transverse lines, outwardly scalloped, which may be so indistinct as to give it a strigate appearance. Under surface with the outer margin of the median band distinctly marked; basal half grayish. Subterminal dark shade visible, terminal area pale, sharply separated from dark shade on the crenulate s. t. line.

Secondaries: Basal half powdered with gray, this area terminating in an irregular dark line which is lost toward the costa. Beyond this the wing is similar to the primaries, but a little more pinkish and more evenly powdered. Under surface with dark line reproduced. Terminal half of wing powdered with gray except near dark line. Veins as above. Entire wing a little more pinkish than the primaries.

The crenulate lines of the paratype are less definite than those of the type, giving the specimen a regularly strigate appearance, and there are a few other minor differences in the markings. The species differs from *beckeri* Druce (Biol.

Cent. Am., Lep. Het. Pl. 98, fig. 1) in the conspicuous transverse band of the primaries, equally pale throughout its length, and the absence of the yellow shade of the secondaries.

Type 1 ♀, Paradise, Arizona, July. *Paratype* 1 ♀, Palmerlee, Arizona. Both in coll. Barnes, Decatur, Ill.

Hampson includes *Anurapteryx* in the family Sematuridae. According to Forbes it falls in the sub-family Coronidiinae of the Geometridae, (See Jn. N. Y. Ent. Soc., XXV, 47, 52, 1917). No representatives of either have previously been recorded from this country.

We take this opportunity to call attention also to a specimen of *Zunacetha annulata* Guér. taken at San Benito, Texas, and now in the Barnes collection. The species has not previously been recorded north of Vera Cruz, Mexico.

Notes on two Miridae, Camptobrochis and Paracalocoris (Heteroptera).

By W. L. McAtee, Washington, D. C.

Camptobrochis poecilus Reuter ms.

Specimens of *Camptobrochis* have been distributed under this name by the late Otto Heidemann and, using his application of the name, by the writer. Having collected numerous specimens both on the food plant and in hibernation, I became interested in finding out the true name of the bug. It soon became apparent that *Camptobrochis validus* Reuter was rather a lost species and that the *C. poecilus* ms. seemed to fit the description of *validus* very well. At this stage of the study I was assisted very much by the kind loan by Mr. E. P. Van Duzee of a specimen of *C. validus* determined by Reuter. To make a long story short, it appears that *Camptobrochis poecilus* Reuter ms. is the same as *Camptobrochis validus* var. *cuncalis* Reuter,* originally described in part from District of Columbia material.

The distinguishing character of the variety is the chiefly

* Bemerkungen uber Nearktische Capsiden, etc. Acta. Soc. Sci. Fennicae, 36, No. 2, 1909, p. 59.

red cuneus. From simply having the cuneus red, the form varies in rubescence, until in extreme cases the legs chiefly and the venter entirely are involved.

The variety hibernates in the adult stage and has been found under bark of birch, sycamore and maple. The food plant, or at least a food plant, is alder (*Alnus rugosa*), from which at Great Falls, Virginia, nymphs were collected August 21. Associated with this *Camptobrochis* were *C. nebulosus* and species of *Lygus*.

Paracalocoris acceptus McAtee var. **marmoratus** n. var.

Poecilocapsus marmoratus Uhler ms.

Color markings usually more extensive, and deeper than in the typical variety,* brownish black. Antennae darker, especially the third and fourth joints; second with a distinct pale annulus just basad of middle, two complete dark vittae along upper part of side of thorax, and a much interrupted vitta on lower pleurae. Two short fuscous vittae on disc of scutellum.

Type, a female from San Jose del Cabo, Lower California, Type No. 22,592 U. S. National Museum. Four paratypes also from Lower California (U. S. N. M.)

While on the subject of *Paracalocoris* it is worth noting that *P. limbus* (loc. cit., p. 380), described from an elevation of more than 2000 feet near Clayton, Georgia, appears to be a mountain form, as it has subsequently been received from Southern Pines, North Carolina, and from Mt. Tom, Massachusetts.

An Interesting Gynandromorphic Butterfly (Lepid.; Rhop.).

Master George F. Pettinos, of Merion, Pennsylvania, has recently captured a gynandromorphic specimen of *Papilio turnus*. The left hand side of the specimen has the wings normal male, and the right side of the specimen has the wings normal male, and the right side is black female. Mr. W. H. Edwards in his *Butterflies of North America*, Vol. 2, figures a specimen in which the left wings are black female and the right wings are yellow female. This is the first specimen I have seen in which the two sides represent the male and female.—HENRY SKINNER.

**Paracalocoris acceptus*. McAtee, W. L., Key to the Nearctic species of *Paracalocoris*. Ann. Ent. Soc. Am., Vol. 9, No. 4, Dec., 1916, p. 389 [Organ Mts., N. Mex.].

Two New Asyndetus with a Table of the North American Species (Dolichopodidae, Diptera).

By M. C. Van Duzee, Buffalo, New York.

Table of Males.

1 All tibiae partly or wholly yellow.....2
Hind tibiae black 5
2 Fore tarsi modified; hind tibiae blackened at base.....3
Fore tarsi normal; hind tibiae blackened at tip.....4
3 First joint of fore tarsi incrassated.....*ammophilus* Loew
Second joint of fore tarsi with a clavate, haltere-like, yellow appendage .....*appendiculatus* Loew
4 Front and face very wide and covered with silvery pollen; palpi black .....*latus* V. D.
Ground color of the front and face showing through the white pollen; palpi rather large, white.....*caudatus* V. D.
5 All tibiae black or brown.....6
Fore tibiae yellowish, sometimes the middle ones also.....9
6 Third antennal joint large, about twice as long as wide.....7
Third antennal joint rather small, but little longer than wide...8
7 Second antennal joint extending over the upper edge of third joint to near its middle .....*occidentalis* sp. nov.
Second antennal joint not extending beyond the base of third joint .....*nigripes* V. D.
8 Mesonotum with a brownish-dusted vitta, between two bluish gray ones .....*fratellus* Ald.
Mesonotum not vittate .....*interruptus* Loew
9 Third antennal joint somewhat quadrilateral in outline.....10
Third antennal joint not at all quadrilateral in outline, but with a point or rounded at tip 12
10 Fore tibiae with only short hairs; third antennal joint but little longer than wide .....*cornutus* V. D.
Fore tibiae with long bristle-like hairs on the whole upper surface; third antennal joint twice as long as wide; second joint extending to the middle of the third above, at which point the third is attached 11
11 Second antennal joint ending in a rounded tip near the middle of third joint, which is nearly straight above....*syntormoides* Wh.
Second antennal joint ending in a sharp point at tip; upper edge of third joint concave .....*harbeckii* V. D.
12 Third antennal joint rounded at tip; second joint reaching the middle of the third above.....*longipalpis* sp. nov.
Third antennal joint rounded below, pointed at tip.....13

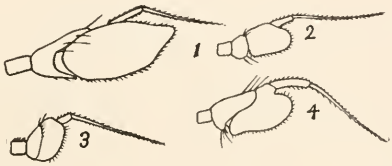
13 Third antennal joint notched where the arista is inserted; fore tibiae with a row of rather long slender bristles above, *johnsoni* V. D.

Third antennal joint not notched on upper edge where the arista is inserted; fore tibiae with a row of small hair-like bristles above or nearly bare ..... *texanus* V. D.

Asyndetus occidentalis sp. nov.

♂. Length 2.5-3 mm. Face moderately wide, a little longer than wide, with thin white pollen, the ground color showing through. Front a little wider than the face, shining green; palpi and proboscis black. Antennae black (Fig. 1), not large, second joint extending narrowly to near the center of the upper edge of third joint, at which point the third joint is attached. Lateral and inferior orbital cilia white, a few of the upper cilia black.

Thorax and pleurae shining green with more or less blue reflections, in the holotype the thorax is mostly blue. Abdomen green with black incisures and coppery reflections; hypopygium small with small bristles.



Antennae of *Asyndetus*.—Fig. 1, *A. occidentalis* male; fig. 2, *A. occidentalis* female; fig. 3, *A. nigripes* female; fig. 4, *A. longipalpis* male.

Coxae and femora metallic green; tibiae and tarsi black; fore femora with a row of black bristles below, which are not as long as the width of the femora, outer side with rather long hairs; fore tibiae with a row of hair-like bristles above. Calypters and halteres whitish, the former with white cilia.

Wings grayish; last section of fourth vein bent near its apical third but not interrupted, beyond this bend the vein is very thin, not much more than a fold in the wing; cross-vein far before the tip of the first vein.

♀. Agrees with the male, except that the fore tibiae have three small bristles and a row of short hairs above. The antennae are also smaller than those of the male.

Described from two males and twelve females taken at Los Banos, California, May 22, 1918, by E. P. Van Duzee.

Type in the collection of the California Academy of Sciences.

The male differs from that of *A. nigripes* in the formation of the antennae and the last portion of the fourth vein is more slender. The female differs in the form of the antennae. Fig. 3 is the antenna of the female of *nigripes*, while Fig. 2 represents that of the female of *occidentalis*.

Asyndetus longipalpis sp. nov.

♂. Length 3.7 mm. Face wide with silvery white pollen; front blue-green, the white pollen of the face extends onto the lower half of the front. Antennae black (Fig. 4), third joint broadly rounded at tip, attached to the second at a point near the middle of its upper edge; palpi nearly as long as the antennae, narrow, black, fringed with black hairs; upper orbital cilia black, lower whitish, becoming longer below.

Thorax shining green with bronze reflections and with grayish pollen along the front, which forms quite distinct vittae. Scutellum and second abdominal segment with strong blue reflections. Abdomen green with quite abundant white pollen; base of segments three to five blackish, the border of this black color and the base of the second segment coppery. Hypopygium small, in the type with one large bristle (probably there were more but they have been broken off).

Coxae and femora black with slight green reflections; fore femora with a row of bristles below; middle femora with long hairs below. Fore and middle tibiae yellow; hind tibiae blackish; middle and hind tibiae each with about four bristles above, those of the middle pair the longest. All tarsi blackish. Calypters and halteres whitish, the former with white cilia.

Wings tinged with brown, especially in front; last section of fourth vein broken near its second third, its last portion being entirely separated from the first; cross-vein nearly opposite the tip of the first vein.

♀. Face a little wider; palpi of the usual form, black; thorax with three narrow coppery vittae on the dorsum; wings less tinged with brown.

Described from one pair taken at Puerto Barrios, Guatemala, in March. *Type* in the author's collection.

Chalcid Travels Through Blackbird (Hym.).

At the meeting of the Entomological Society of London, held Dec. 4, 1918, the President, Dr. C. T. Gahan, exhibited a Chalcid, *Torymus elegans* Borkh., which had emerged from a rosaceous seed which had passed through the alimentary canal of a blackbird, together with the seed from which it had appeared. (Ent. Mo. Mag., London, February, 1919.)

Tinea cloacella Haworth bred from Fungi (Lepid.).

By Harry B. Weiss, New Brunswick, New Jersey.

In Dyar's List of North American Lepidoptera (Bull. 52, U. S. N. M.), the distribution of *Tinea cloacella* is given as follows:—"Europe, U. S.?" Dietz in his revision of the *Tineinae* (Tr. Am. Ent. Soc. vol. XXXI, No. 1, 1905, p. 67) writes as follows concerning this species: "Mr. A. Busck very kindly sent me a European specimen of this species for study and which corresponds in all particulars with the description given by European authors of this species. I have not seen any species from within our faunal limits that could be recognized as *cloacella* nor do I know of the existence of a well-authenticated specimen anywhere. I cannot help, therefore, but to consider the occurrence of *cloacella* in our fauna as very doubtful."

At Matawan, New Jersey, on February 25, an old specimen of *Polyporus sulphureus*[1] Bulliard ex Fries collected from a telegraph pole was partly broken and found to contain numerous, small lepidopterous larvae. The remainder of the fungus was kept in a warm room and during the last of March and first half of April, moths of this species[2] emerged. *Polyporus tsugae* Murrill ex Overholts, collected at New Brunswick, New Jersey, is also a host of this moth as specimens emerged from this fungus during the second week of April. The species, therefore, hibernates as a larva and pupates during the spring. Of course in the warm laboratory, the moths emerged sooner than they would have done in the field. The larvae feed in the context of the fungus and pupate in the tubes. So as to facilitate the emergence of the moths, the pupae issue partly from the lower surface of the fungus.

Polyporus tsugae occurs on or about stumps and trunks of hemlock and pine, while *Polyporus sulphureus* is found on the stumps and trunks of deciduous and coniferous trees. According to Von Schrenk and Spaulding (U. S. D. A. Bur.

[1] Identified by Mr. Erdman West.

[2] Identified by Mr. A. Busck through the courtesy of Dr. L. O. Howard.

Plant Indus. Bull. 149) *Polyporus sulphureus* occurs chiefly on oaks, chestnut, maples, black walnut, butternut, alder, locust, apple and pear and is widely distributed throughout the United States and Canada and in most of the forest regions of Europe where it is regarded as a destructive parasite both on deciduous trees and conifers.

Full Grown Larva. Length 6.2 mm.; width 1.4 mm. Subcylindrical; whitish except for head and mouth parts which are dark; sparsely hairy, hairs long, arising from somewhat tuberculate bases; entire body surface covered with a fine short pile; antenna cylindrical, two-jointed, terminated by one long and several short hairs; ocelli lateral, five in number, three in one group and two in the other; dorsal surface of second and third thoracic and first abdominal segments transversely wrinkled; legs whitish, terminated by strongly chitinized hooks; abdominal segments 4, 5, 6, 7 and 8 longer than other body segments.

Pupa. Length 5 mm., width 1.1 mm. Brownish, sparsely hairy; dorsal surface of abdominal segments 3, 4, 5 and 6 bearing two transverse rows of short stout spines placed close together; remaining three abdominal segments bear a single dorsal row of larger and fewer spines; abdominal dorsal spines point posteriorly; last abdominal segment bears a ventral pair of chitinous hooks curved anteriorly.

Adult. Tinea cloacella Haworth, *Lep. Brit.*, 563, 1829; Dietz (loc. cit.) gives the following description by Meyrick: "Head whitish ochreous. Forewings ochreous brown, more or less mixed with whitish and strigulated with dark fuscous; a spot on base of costa, another beyond it, a thick oblique spot from costa reaching middle of disc, an elongate spot on fold before middle, and some small posterior costal and dorsal spots dark fuscous; a small round whitish posterior spot in disc. Hindwings fuscous. Exp. 10-17 mm."

Richness of Borneo in Coleoptera.

"The great majority of the Coleoptera taken at Mount Merinjak were again new to me, which goes to show how every hill and mountain in a great island like Borneo must be thoroughly explored before we have any idea of the tremendous wealth of species the island will produce. Wallace during his stay in Borneo spent nearly the whole of his time on the Sadong River in Simunjan, and collected nearly 2000 species of Coleoptera, of which nearly 300 were Longicorns. During my short stay [six months] I obtained examples of approximately 3189 species, of which 369 were Longicorns, about 90 of these probably nov. spp. We must remember that Wallace was collecting practically all orders, whereas I was specializing more or less." [A table of the number of species by families is given.]—G. E. Bryant in The Ent. Mo. Mag., London, April, 1919.

Life History and Habits of Silpha inaequalis Fab. (Coleoptera).

By Milton T. Goe, Portland, Oregon.

On July 16th while strolling in a secluded place, my object being to secure some live insects for life history observations, I discovered the carcass of a cat, under or near which were many kinds of beetles that gather around decaying animal matter. From among these I secured a few live specimens of *Silpha inaequalis* which I took home and placed in wide-mouthed tobacco jars containing a couple of inches of fresh moist soil, a few dry leaves beneath which they could hide, a shallow vessel of water, and a small piece of beef. The jars were then covered with a tin cover, the center of which had been cut away and a piece of cheese-cloth glued over the opening so as to admit plenty of air.

Two pairs were kept for study, but as one female laid but one batch of eggs and as both male and female soon died the data here given are from a single pair.

Freshly-killed flies were often thrown into the jar and were eaten by the beetles in preference to the stale meat. They sometimes dug themselves into the soil but remained on top most of the time, often hiding under the leaves, seldom under the stale meat. They were frequently found drinking. Close watch was kept for eggs, and on the twentieth day of July the first eggs were found and in the soil. As it is generally stated that these insects deposit their eggs in the carcass, I wish to emphasize the fact that these Silphas, without an exception, deposited their eggs in the soil. Only once did we observe this female in the act of laying, and then she placed the tip of her abdomen deep in the soil and when she had finished scratched the dirt back with her front tarsi to cover the eggs more securely.

The eggs are white, almost round, and about two millimeters in diameter. The egg-laying period covered thirty-six days and she averaged a little less than two eggs per day.

Following are the dates and the exact number of eggs laid each day:

July 20	6 eggs	August 1	2 eggs
July 21	3 eggs	August 3	1 egg
July 23	9 eggs	August 5	1 egg
July 24	3 eggs	August 15	4 eggs
July 26	6 eggs	August 18	6 eggs
July 28	5 eggs	August 20	7 eggs
July 30	5 eggs	August 23	2 eggs
		August 25	2 eggs

Total 62 eggs

On August 27th this female died. The six eggs laid July 20th were buried in some moist soil in a jar to hatch, and July 26th four coal-black larvae with yellowish red beads and black antennae made their appearance. These larvae were quick of motion; fed freely on the stale beef; rarely entered the soil, but usually could be found close together under the dry leaves.

Moulting occurred twice before they entered the soil to pupate; the first time July 30th, the second time August 3rd. When moulting the exuviae split at head and thorax and the insects crawl out, leaving the cast skins much resembling dead larvae.

During the afternoon of August 11th two of the larvae entered the soil to transform and the two remaining out were acting very strangely. They would dash frantically across the jar in which they were kept, suddenly stop and curl up on their sides, lie so a second, then roll over on their backs, then up and dash away again. These actions were repeated many times showing the unrest at the time this transformation was about to begin.

As an experiment, we dropped a few drops of water upon them, which seemed to have a soothing effect, as they lay quietly as if appreciating it. During the night, they, too, entered the soil. August 18th we uncovered them and they were unchanged in form but were pure white in color. Three of the four larvae developed, coming out of the soil as adults August 28th, 29th and 31st, respectively.

In this instance, the period of incubation was six days; the larval period sixteen days; the pupal period from seventeen to twenty days.

The young beetles ate very little at any time, and during the

winter months took no food at all. They spent most of their time in the soil, seldom being seen on top.

March 30th a piece of liver was placed in the jar and a few hours later one of the beetles was found clinging to it, this being the first evidence of their eating anything since November. During April these insects died, thus closing our investigations.

[Blatchley, in his Coleoptera of Indiana, p. 276, has figured the various stages of *Silpha inaequalis* after Riley.—Ed.]

On the Hymenopterous Parasites of Kermes (Homop., Coccidae).

By L. O. Howard, Washington, D. C.

In the very interesting article in *Entomological News* for April, 1919, on "Euclemensia bassettella (Clemens), the Kermes Parasite," by A. H. Hollinger and H. B. Parks, the authors have brought together much important material concerning this unusual parasitic Lepidopteron. In the course of this article, the writers state that they have never reared any Hymenoptera from *Kermes*, either in Missouri or Texas.

From the context, however, they apparently have not studied the subject for a very considerable length of time, and I feel reasonably sure that Hymenopterous parasites of *Kermes* will be found sooner or later in both Missouri and Texas, just as they have been found in so many other parts of the world. A good many years ago (in 1890) I found *Kermes* at Ithaca, New York, infested both by this Lepidopterous parasite and by a Hymenopterous parasite which I subsequently described as *Aphycus pulchellus* (afterwards placed by Timberlake in his genus *Acnasioidea*).

I have taken the trouble to go through the records and to examine the bred specimens in the notes and collections of the Bureau of Entomology and the National Museum, and submit the following list of Hymenopterous parasites of *Kermes*, both from these sources and from the literature. There can be no doubt that the hosts in the cases of the American rearings

were true *Kermes*, but following the first list is a list of records taken from the remarkable list of rearings by Giraud collected and annotated by Laboulbène and published in the *Annales de la Société Entomologique de France* for 1877 (pages 397-436) in which the identification of the hosts as *Kermes* is open to doubt, judging from the food plants on which they occurred. No true *Kermes* are known except upon oak, and the food plants indicated in this French list belong to a variety of genera. It is altogether likely that Giraud called almost any naked Lecaniine *Kermes*. And these records are included here simply because they are already matters of record. It is evident that they should not be accepted except possibly in the cases where they are recorded as occurring on *Quercus*. Mr. Harold Morrison has prepared a note on these Giraud rearings which is appended to the list.

Aenasioidea kermicola Timb.

Kermes galliformis Riley. Murray, Utah, Sept. 16-21, 1914, P. H. Timberlake.

Kermes essigii King on *Quercus agrifolia*, Pasadena, California, Aug. 7, 1912, P. H. Timberlake. Timberlake, 1916, Proc. U. S. N. M., 50, p. 584.

Aenasioidea latiscapus (Gir.).

Kermes pubescens Bogue on oak. Urbana, Illinois, A. A. Girault. Girault, 1911, Can. Ent., 43, pp. 168-78.

Aenasioidea (Aphycus) pulchella (How.).

Kermes on *Quercus tinctoria*, Ithaca, New York, Jan. 25-30, 1890, L. O. Howard. Howard, 1898, Proc. U. S. N. M., 21, p. 242.

Aenasioidea tenuicornis Timb.

Kermes miyasakii Kuwana. Akabane, Japan, Aug., 1900, S. I. Kuwana. Timberlake, 1916, Proc. U. S. N. M., 50, p. 583.

Blastothrix longipennis How.

Kermes pubescens Bogue. Guelph, Canada, Alfred Eastham. Eastham, Rept. Ent. Soc. Ont., 1910, p. 75.

Chiloneurus lineascapus Gahan.

Kermes on oak, College Park, Maryland, May 7, 1898, A. B. Gahan. U. S. N. M. collection.

Kermes on lilac, College Park, Maryland, May 7, 1898, Franklin Sherman, Jr. Gahan, 1910, Can. Ent., 42, p. 207.

Chiloneurus dubius How.

Kermes sp. Malden, Massachusetts. Bureau Ent. Notes, No. 2404.

Chiloneurus cushmani Cwfd.

Kermes sp. Vienna, Virginia, May 24, 1911, R. A. Cushman. Crawford, 1911, Proc. Ent. Soc. Wash., 13, p. 126.

Comys sp.

Kermes galliformis. Los Angeles, California. U. S. N. M. Collection.

Comys, n. sp.

Kermes nigropunctatus. Whittier, California, E. W. Rust. Bureau Ent. Notes.

Comys sp. (probably *fusca*).

Kermes sp. on live oak. Houston, Texas, March 19, 1919, A. D. Hopkins. Bureau Ent. Notes.

Cristatithorax pulcher Gir.

Kermes pubescens Bogue on oak. Urbana, Illinois, A. A. Girault. Girault, 1911, Cant. Ent., 43, pp. 168-78.

Encyrtus sp. (*cyaneus* group).

Kermes on oak. Tallulah, Louisiana, May 21, 1907, A. H. Rosenfeld. U. S. N. M. Collection.

Microterys speciosissimus Gir.

Kermes pubescens Bogue on oak. Urbana, Illinois, A. A. Girault. Girault, 1911, Can. Ent., 43, pp. 168-78.

Microterys cincticornis Ashm.

Kermes pubescens Bogue on oak. Urbana, Illinois, A. A. Girault. Girault, 1911, Can. Ent., 43, pp. 168-78.

Kermes pubescens on oak. Lawrence, Massachusetts, Geo. B. King. Bureau Ent. Notes, No. 8143.

Coccophagus n. sp.

♂ ♂ *Kermes quercus* (*undulata*). Nogales, Arizona, May 3, 1897, A. Koebele. U. S. N. M. Collection.

Coccophagus scutatus How.

Kermes sp. on *Quercus agrifolia*. Los Angeles, California, A. Koebele and D. W. Coquillett. Howard, 1911, Jour. Econ. Ent., 4, p. 277; Mercet, 1912, Trab. Mus. Nat. Madrid, p. 244.

Kermes nigropunctatus. Southern California, Aug. 7, 1909, E. R. Sasscer. U. S. N. M. Collection.

Myiocnema comperei Ashm.

Kermes acaciae Mask. Sydney, New South Wales, Dec. 21, 1899, A. Koebele. U. S. N. M. Collection.

Prospaltella citrella How.

♂ ♂ *Kermes quercus* (*undulata*). Nogales, Arizona, May 3, 1897, A. Koebele. U. S. N. M. Collection.

Gyrolasia sp.

Kermes pubescens Bogue on oak. Urbana, Illinois, A. A. Girault. Girault, 1911, Can. Ent., 43, pp. 168-78.

Pachyneuron micans How. (?)

Kermes pubescens Bogue on oak. Urbana, Illinois, A. A. Girault. Girault, 1911, Can. Ent., 43, pp. 168-78.

Giraud's records of his French rearings (Ann. Soc. Ent. France, 1877).

Pachyneuron kermiphagus Giraud. *Kermes* on *Festuca, Carpinus* and *Crataegus.*

Eunotus obscurus Giraud. *Kermes* on *Carpinus, Crataegus* and *Ostrya.*

Encyrtus punctipes Dal. *Kermes* on *Crataegus, Carpinus, Aesculus, Alnus, Quercus* and *Ulmus.*

Encyrtus erichsoni Westw. *Kermes* on *Ostrya vulgaris, Acer eriocarpus* and *Festuca.*

Encyrtus apicalis Dalman. *Kermes* on *Acer eriocarpus, Ostrya vulgaris* and *Pinus picea.*

Coccophagus scutellaris Nees. *Kermes* on *Alnus* and *Festuca.*

Coccophagus circumscriptus Ratzbg. *Kermes* on *Pinus picea.*

Ericydnus paludatus Halid. *Kermes* on *Pinus picea.*

Cerapterocerus corniger Haliday. *Kermes* on *Quercus sessiliflora.*

Cerapterocerus mirabilis Westw. *Kermes* on *Festuca.*

Chiloneurus elegans Westw. *Kermes* on *Laurus cerasus.*

Chiloneurus ornatus Westw. *Kermes* on *Salix.*

Coccophagus pantherinus Giraud. *Kermes* on *Festuca.*

Comys obscurus Dalman. *Kermes* on *Salix.*

Encyrtus aralius Walker. *Kermes* on *Festuca.*

Encyrtus cyaneus Dal. *Kermes* on *Festuca.*

Encyrtus festucae Giraud. *Kermes* on *Festuca.*

Encyrtus pascuorum Foerster *Kermes* on *Festuca.*

Encyrtus pratorum Giraud. *Kermes* on *Festuca.*

Eunotus cretaceus Walker. *Kermes* on *Festuca.*

Rhopus debilis Foerster. *Kermes* on *Triticum repens.*

Appended Note by Harold Morrison.

None of the species of "Kermes" in the Giraud list appears to belong to that genus in its modern taxonomic sense. This opinion is based on the fact that with two exceptions, one of which appears to be accidental, only *Quercus* spp. are recorded as host plants of the species of this genus, and that there are in France certain common Lecaniine scales known to occur on the host plants given in this list. The probable identity of these different scale insects is given below:

Festuca spp. All records from this host plant are probably *Eriopeltis festucae* or *E. lichtensteinii*, the latter being probably a synonym of the first. This species is covered by a cottony sac in the last stages, just before oviposition, but appears to be naked in its early stages of growth.

Triticum repens. This record is probably for the preceding species.

Quercus sessiliflora. Regarding this "Kermes," Reh, Allg. Zeitschr. Ent., 8, 1903, p. 355, states: "der 'Kermes du Chene' der franzosischen Autoren ist *Lecanium pulchrum* King." This statement probably applies to this record from the list of Giraud and Laboulbène.

Laurus cerasus. A number of Lecaniine species have been reported from *Laurus.* The most common is *Coccus hesperidum*, but it is impossible to suggest any certain genus and species for this record.

Salix spp. This coccid is possibly *Lecanium capreae*, but might be one of several Lecaniine species.

Pinus picea. This reference is probably to *Physokermes piceae*, although it might refer to one of several species.

Alnus sp. Probably refers to *Lecanium coryli.*

Acer sp. Possibly *Lecanium corni*, but might be one of several species.

Ostrya vulgaris. Perhaps *Lecanium corni*, but might be one of several species.

Crataegus sp. Might be any one of several species of *Lecanium.*

Carpinus sp. Probably *Lecanium coryli*, but might be one of several species.

Aesculus sp. Probably *Lecanium coryli.*

Ulmus sp. Might be one of several species of *Lecanium* or even *Gossyparia spuria.*

Regarding the taxonomic position of the Genus *Kermes* Boit., this genus has at various times been included with the Lecaniine scale insects, and with the large group of the mealybugs, as recognized by Cockerell and by the Fernald Catalogue of Coccidae. Of recent years, however, there has been a growing tendency to consider this single genus as a separate group of the Coccidae having subfamily value as compared with the subfamilies at present recognized. The name *Hemicoccinae* is given to this group. What its ultimate position in the classification of the family will be it is impossible to state, but at present it seems a little more closely related to the Lecaniinae (or Coccinae) than to any other subfamily.

Notes on Cosmopterygidae, with Descriptions of new Genera and Species (Microlepidoptera).

By Annette F. Braun, Cincinnati, Ohio.

Cosmopteryx opulenta n. sp.

Palpi white, outer and inner surfaces each marked with a black longitudinal line. Antennae grayish brown, becoming darker towards apex; with a conspicuous white line on anterior surface near base; last segment black, or sometimes merely black-tipped; next three preceding segments white; next three segments black, followed by a white, then a black, then a white segment. Head and thorax grayish brown, with three longitudinal white lines.

Fore wings brownish gray, or seal brown, with the basal half marked with five fine white longitudinal lines; one starting from base just within the costal edge diverges from the costa outwardly, extending about two-thirds through the basal brown area; a second extends along the extreme costa from the basal fourth almost or quite to the yellow fascia, becoming broader outwardly; a third along middle of wing from base to a little beyond the costo-basal streak; a fourth shorter streak below fold not attaining the base; a fifth white streak dorso-basal. Just beyond middle of wing, a yellow fascia. Four patches of metallic scales; the costal one of the inner pair limits the fascia inwardly, not touching the costa, and has a few black scales on its outer margin; dorsal patch placed farther back and with black scales on its inner margin; the yellow fascia extends between them and borders the inner side of the dorsal patch, sometimes almost to dorsal margin. Posterior pair of metallic patches almost opposite, attaining the margins, and limiting the yellow fascia outwardly, except in the middle of the wing where the fascia extends between and a little beyond them. Costal cilia immediately following the second costal metallic patch white; occasionally the yellow of the fascia is almost confluent with this white patch. Remainder of apical portion of wing and cilia of the basal brown ground color, except for a long white line extending from just beyond the yellow fascia to the tips of the apical cilia. Hind wings and cilia concolorous with fore wings. Legs gray streaked and banded with white.

Expanse: 9.5-10.5 mm.

Locality: Rivera, Los Angeles County, California.

Type and paratypes in writer's collection.

Nine specimens bred from irregular mines on *Ambrosia psylostachya*. The mines extend principally along the midrib, with irregular projections branching out on either side. The larva spins a cocoon on the densely pubescent under side of the leaf, constructed of silk, and the whitish pubescence of the leaf. Mines collected in October; imagoes in April of the following year.

This species is apparently intermediate between *C. delicatella* Wlsm. and *C. quadrilinella* Cham.; the additional white streak along the second fourth of costa distinguishes it from both.

Cosmopteryx clemensella Stainton.

The larvae of this species mine the overwintering leaves of *Carex laxiflora* var. *latifolia*, making long semitransparent irregular galleries, often deserting one mine to form a new one. The larvae feed during the fall and early winter, when the weather is sufficiently mild, and become full fed in the spring. They pupate in a wrinkle in the leaf, and the moths appear in May and June. There is apparently but one generation a year.

PERIPLOCA new genus.

Labial palpi long, recurved, laterally flattened, terminal joint shorter than second, acute. Head short, vertex broad. Antennae 2-3, basal segment flattened, somewhat enlarged, projecting posteriorly. Fore wings ovate-lanceolate, acuminate; 1b furcate, 2 from near end of cell, indistinct, 3 from angle, 4 obsolete toward origin, especially in female, 5 and 6 out of 7, 8 out of 7 before 5, 9 approximate to their stalk, 10 arising opposite 2 in female, much nearer base in male, in which it is nearly parallel to 11, which in both sexes arises before middle of cell, transverse vein indistinct between 4 and 7. Hind wings linear-lanceolate, 1-4, cilia 5, costal shoulder pronounced; 2, 3, 4, equidistant and parallel, 4 and 5 connate or nearly so, approximate to 7, 6 out of 7 near apex; transverse vein indistinct but perceptible. Posterior tibiae with bristly scales above and long hairs above towards apex.

Genotype: *Periploca purpuriella* n. sp.

Periploca purpuriella n. sp.

Palpi bluish black, face bronzy. Head, antennae, thorax and base of fore wing bluish black, gradually shading outwardly to reddish bronze. According to the light the wing may appear almost entirely deep blue, or entirely reddish bronze except at extreme base. Hind wings shining, becoming bronzy towards apex. Legs deep bluish black. Expanse: 8 mm.

Locality: Fredalba, San Bernardino Mts., California, August 19 to September 1 (G. R. Pilate).

Type and paratypes in writer's collection.

Described from about 45 specimens.

AMAUROGRAMMA new genus.

Head rather elongate, front prominent. Antennae 2-3, biserrate in outer half, basal segment rather long, slightly enlarged distally. Labial palpi long recurved, somewhat thick-

ened with scales, third segment a little over one-half the second, acute. Posterior tibiae rough-haired above and on outer half beneath.

Fore wings with tufts of raised scales; very narrow, apex long pointed; 1b furcate, lower side of furcation obsolete, 2 absent, 3 and 4 long stalked from angle of cell, 5 indistinct except near margin, 7 and 8 out of 6, 11 from middle of cell. Hind wings 1-3, linear beyond costal shoulder, with apex produced; cilia 6; most of veins obsolete, lower margin of cell distinct, 2 and 3 given off close to margin, 4 and 5 absent, 6 and 7 long stalked.

Genotype: *Amaurogramma extensa* n. sp.

A development of *Chrysopeleia*, from which it differs by the more elongate and slender palpi, the difference being due to the greater length of the second segment, and the narrower elongate wings, with stalking of 4 and 5 in the fore wing; the extreme narrowing of the hind wings is accompanied by the obsolescence of most of the veins. *Chrysopeleia quadricristatella* Chambers apparently belongs here, but is distinct from the species described below.

Amaurogramma extensa n. sp.

Head, thorax and fore wings clothed with whitish-tipped gray scales, producing a uniformly irrorated aspect. Four patches of blackish raised scales on the fore wing, each margined inwardly with dull whitish; the first below the fold at one-fourth, the second on the disk in the middle of the wing, the third a little beyond it on the dorsum, the fourth at end of cell; a fifth raised patch beyond is distinct in the male. Minute tufts along the termen. Hind wings and cilia gray. Legs gray, with tips of segments whitish; hind tibiae with an oblique white bar across the middle of the outer side. Abdomen gray, upper side of first four or five segments yellowish. Expanse: 7.5-9 mm.

Type (male), Loma Linda, California, July 22; paratype (female), Loma Linda, California, June 3 (G. R. Pilate), in writer's collection.

Ithome unimaculella Chambers.

Ithome unimaculella Chambers, Can. Ent. vii, 94, 1875; xi, 9, 1879.

The statement by Chambers that *Ithome* cannot be separated generically from *Perimede* is apparently the basis for the accepted view that *I. unimaculella* is a synonym of *P. erransella* Cham. While the two insects are superficially much alike, they can be easily separated structurally and by markings. The characters of *Ithome* Cham. are as follows:

Palpi long recurved, slender, smooth, third segment a little exceeding the second, acute; antennae as in *Perimede*, basal segment somewhat elongate, slightly clavate, stalk serrate near apex. Fore wings without scale tufts; 1b furcate, 2 from very near angle of cell (opposite origin of 10), 3 from angle, 4 remote at origin, but curving immediately downward toward 3, 7 and 8 stalked, 6 out of 7 near apex, 11 from middle of cell. Hind wings 1-2, linear lanceolate, 2, 3, 4 parallel, equidistant, 5 approximate to or connate with 4, 6 and 7 long stalked, cell open between 5 and 7. Hind tibiae rough haired above.

Apart from the stalking of 6 with 7 in the fore wing, and the stalking of 6 and 7 of hind wing, the position of vein 2 of fore wing is the chief difference between this genus and *Perimede*, where this vein arises but slightly beyond 11. The hind wings are much narrower, with more deeply excised costa and pronounced costal shoulder. To Chambers' genus *Eriphia* it has no resemblance.

In addition to these structural differences, *Ithome unimaculella* differs from *Perimede erransella* by its smaller size (7.5-9 mm.), the series of distinct white spots on the under surface of the third palpal segment (varying in number from four to seven, including the white extreme apex as a spot), the absence of markings except the costal spot before the cilia, a very minute plical spot, and the immaculate under surface of the wings. As both species easily become worn on the upper side, and a slight abrasion produces a sordid whitish spot, the palpal markings and the immaculate under surface of the wings are the most reliable characters.

Perimede falcata n. sp.

Head and thorax shining whitish gray, densely dusted with fuscous; palpi shining grayish brown with the upper sides whitish, lower surfaces faintly hoary. Antennae dark grayish fuscous.

Fore wings shining grayish white almost overlaid with purplish fuscous dusting. Three spots of raised black scales margined with white inwardly, the first in the fold sometimes elongate, the second in the middle, the third at the end of the cell; a whitish costal spot at the beginning of the cilia and an opposite dorsal one. A black spot in apex, margined inwardly with white scales; a series of minute raised black specks along the termen, usually with whitish scales bordering them inwardly. Cilia along costa to a point opposite apex dark fuscous, beneath apex for about half the termen white, rest of cilia dark fuscous, the line separating the white from the fuscous terminal cilia curving obliquely across the cilia. Under surface of

wings with apex black and series of black spots repeated. Hind wings dusted grayish fuscous; extreme apex on both surfaces black; the under surface mottled with white. Abdomen fuscous, paler beneath, with four black spots on each side of under surface. Legs fuscous, apices of joints white. Expanse: 11.5-14 mm.

Localities: Cincinnati, Ohio; Pittsburgh, Pennsylvania (Engel).

Type (♂), Cincinnati, Ohio, July 28; paratype (♀), Cincinnati, Ohio, July 5; four paratypes, Pittsburgh, Pennsylvania, June 12-30, all in writer's collection.

The conspicuous white patch in the terminal cilia distinguishes this species from *P. erransella* Cham. and from *P. particornella* Busck; from the latter the unicolorous antennae also separate it. It is a much broader winged species than *P. erransella;* with this exception its structural characters differ in no respect from the type of the genus.

Psacaphora metallifera Wlsm.

A number of moths bred from larvae mining leaves of *Cuphea petiolata* answer the description of *Elachista* (?) *metallifera* Wlsm. described from a single specimen in which the type of marking is evidently that of *Psacaphora*. The antennal markings are by no means constant; sometimes the last four or five segments are entirely silvery white; sometimes there is a series of four or five whitish or grayish spots separated by dark spots; and sometimes the entire antennal stalk is dark brown. The blue and purple iridescent dorsal spot is in all, except one specimen, extended along the termen to the apex; in other respects the specimens agree minutely with the description. It is remarkable for its minute size; expanse varying from 4.7 mm. to 6.5 mm.; that of the type was given as 5 mm.

The larva makes several mines; the earliest extremely short and narrow and difficult to discern; later it makes long contorted serpentine mines or blotches, eating out the whole of the smaller leaves near the top of the plant. The larva often crawls for a couple of inches with the greatest ease amongst the extremely viscid hairs of the plant, in which ants and small flies are often caught and held fast. The general color of the larva is bright red, due to the obscuring of the yellowish ground color by the confluence of the bright red markings on either side of the mid-dorsal line. Cocoon spindle-shaped, of dense straw-colored silk.

ENTOMOLOGICAL NEWS.

PHILADELPHIA, PA., NOVEMBER, 1919.

The Use of the Term Larva.

We have recently reread Professor Comstock's article in the *Annals of the Entomological Society of America* for June, 1918, entitled "Nymphs, Naiads and Larvae." It will be recalled that in it he proposes to limit the term *nymph* to the early stages of insects which have a gradual metamorphosis, as the Orthoptera and Hemiptera, and that *naiad* be used for used for the immature stages of Plecoptera, Odonata and Ephemerida ("incomplete metamorphosis"), while *larva* is to be restricted to the young of insects with complete metamorphosis, Diptera, Lepidoptera et al., as some have already done.

To us, however, this very narrow use of *larva* appears decidedly objectionable, since the word has come to possess a much wider significance, having been very generally employed, in various languages, to denote the active, postembryonic stage of many phyla which presents a more or less distinc ly different aspect from the adult. Thus, Professor Edmond Perrier, even after writing:

> The words *larva* and *metamorphosis*, borrowed from the vocabulary of the entomologists, have indeed in Entomology a precise signification from which one turns aside absolutely when one applies them to the development of the Echinoderms, or to that of the Crustacea, or of the great majority of worms. Metamorphosis is a more or less rapid change, either in the internal organs or in the external forms, of an organism already in possession of all the morphological units of which its body is to be formed,

goes on to add:

> Before the transformation, the animal is in the state of a *larva*, after it in the *perfect state*. Such transformations can be observed in numerous groups of the animal kingdom outside of the class of Insects. One can consider as a metamorphosis the transformation of *Ephyra* into a Discomedusa; that of the vermiform larva of *Comatula* into the cystidean larva; that of the females of parasitic Copepods into Lernaeans: that of cypris-larvae of Cirripedes into *Anatifera*, *Balanus* or *Sacculina*; that of symmetrical into asymmetrical *Pagurus*; that of larvae of Bryozoa into protomerids; that of three-segmented

larvae of Brachiopods into adult Brachiopods; that of the tadpoles of Ascidians into Ascidians, of Ammocetes into Lampreys, of Leptocephalus into Conger eels, of symmetrical into asymmetrical *Pleuronectes*, of the tadpoles of Batrachians into salamanders, frogs and toads. [Translated from his *Traité de Zoologie*, pp. 194-5.]

This general use of *larva* for all groups of animals in which a similar stage obtains is decidedly convenient, some such term being a necessity. We notice that the latest text-book of Entomology, Prof. Lochhead's *Class Book of Economic Entomology*, uses *larva* in this wide sense. The subject is one which might well be discussed by the Entomological Society of America at its next meeting.

Entomological Literature.

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded.

The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of papers containing new genera or species occurring north of Mexico are all grouped at the end of each Order of which they treat.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A. London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

4—Canadian Entomologist, London, Canada. **5**—Psyche, Cambridge, Mass. **8**—The Entomologist's Monthly Magazine, London. **9**—The Entomologist, London. **11**—Annals and Magazine of Natural History, London. **12**—Journal of Economic Entomology, Concord, N. H. **13**—Journal of Entomology and Zoology, Claremont, Cal. **17**—Lepidoptera, Boston, Mass. **19**—Bulletin of the Brooklyn Entomological Society. **20**—Bulletin de la Societe Entomologique de France, Paris. **30**—Tijdschrift voor Entomologie, The Hague, Holland. **32**—Insecta. Revue Illustree d'Entomologie, Rennes. **33**—Annales de la Societe Entomologique de Belgique, Brussels. **37**—Proceedings of the Hawaiian Entomological Society. **39**—The Florida Buggist, Gainesville. **40**—Genera Insectorum, Diriges par P. Wytsman. **50**—Proceedings of the United States National Museum, Washington. **52**—Zoologischer Anzeiger, Leipsic. **61**—Proceedings of the California Academy of Sciences, San Francisco. **62**—Bulletin of the American Museum of

Natural History, New York. **69**—Comptes Rendus, des Seances de l'Academie des Sciences, Paris. **73**—Proceedings of the Linnean Society of New South Wales, Sydney. **79**—Bulletin of the Museum of Comparative Zoology at Harvard College, Cambridge, Mass. **90**—The American Naturalist, Lancaster, Pa.

GENERAL. **Berger, E. W.**—Entomology as a pure science. **39**, ii, 81-5. **Blackmore, E. H.**—Rare and uncommon insects taken in British Columbia during 1918 (Rept. Prov. Mus. Nat. Hist., Br. Columbia, 1918, T. 7-13). **Bordage, E.**—Sur quelques particularites de l'histolyse observees pendant la metamorphose des insectes metaboles. **20**, 1919, 258-9. **Escherich, K.**—Zeitschrift fur angewandte entomologie IV, Heft 2. **Godman, F. DuC.**—Memorial to the late Frederick DuCane Godman. **8**, 1919, 206-7. **Ireland, W. H.**—On the migration of insects. **17**, iii, 57-8. **Klapalek, F.**—[Notice of death.] **52**, 1, 208. **Lizer, C.**—Primer ensayo bibliografico de entomologia Argentina. (Primera Reun. Nac. Soc. Argent. Cien. Nat., Tucuman, 1916, 351-380.) **McDunnough, J. H.**—Directions for collecting and preserving insects. (Canada Dept. of Agric., Ent. Branch, Circ. 12). **Stoner, D.**—Collecting terrestrial arthropods in Barbados and Antigua. 4, 1919, 173-8 (cont.).

GENETICS, ETC. **Zeleny, C.**—Change in the bar gene of Drosophila involving further decrease in facet number and increase in dominance (Jour. Gen. Physiology, ii, 69-71).

ARACHNIDA AND MYRIAPODA. **Emerton, Banks & Chamberlin**—Spiders, Mites and Myriapods (Rept., Canadian Arct. Exp., 1913-18, iii, H.).

NEUROPTERA. **Folsom, J. W.**—Collembola from the Crocker Land Expedition. **62**, xli, 271-303. **Longinos Navas, R. P.**—Algunos insectos N. de la Republica Argentina (Revista, R. Acad. Cien Exact. Fisic. Natur., Madrid, xvii, 287-305.) **Navas, R. P. L.**—Algunos insectos de la Republica Argentina (Revista R. Acad. Cien. Exact. Fisc. Nat., Madrid, xvi, 491-504).

Baker, Ferris & Nuttall—Mallophaga and Anoplura (Rept., Canadian Arctic Exp., 1913-18, iii, D.). **Banks, N.**—Neuropteroid insects (Rept., Canadian Arctic Exp., 1913-18, iii, B.). **Folsom, J. W.**—Collembola (Rept. Canadian Arct. Exp., iii, A.). **Treherne, R. C.**—Notes on Thysanoptera from British Columbia. 4, 1919, 181-90. **Watson, J. R.**—New Thysanoptera from Florida. **39**, ii, 97-102, 116-19; iii, 2-7.

ORTHOPTERA. **Pantel & de Sinety**—Sur le nombre des stades postembryonnaires chez les Phasmides, leur fusion et leur dedoublement. **30**, lxii, 1-29.

HEMIPTERA. Baker, A. C.—On the use of the names Lachnus and Lachniella. **4**, 1919, 211-12. **Britton, W. E.**—Swarms of aphids. **12**, xii, 351. **Ferris, G. F.**—Observations on some mealybugs (Coccidae). Lack-producing insects of the U. S. **12**, xii, 292-99; 330-3. **Leonard, M. D.**—The immature stages of Strongylocoris stygica (Miridae). **4**, 1919, 178-80. **Lizer, C.**—Una nueva subespecie de "Ceroplastes" de la Republica Argentina (Coccidae). Sobre una nueva hemipterocecidia Argentina. (Primera Reun. Nac. Soc. Argentina Cien. Nat., Tucuman, 1916, Sec. Zool., 381-88.) **Merrill, G. B.**—Host list of the fluted, or cottony cushion scale. (Quart. Bul. Sta. Plant Bd. of Florida, iii, 125-33.) **Moreira, C.**—Les pucerons et leur oeuf d'hiver (Aphididae). **20**, 1919, 236-8. **Parshley, H. M.**—Note on the sexes of the Tingid, Melanorhopala clavata. A morphological note on the Tingoidea. **19**, xiv, 102-3; 109-10. **Riley, C. F. C.**—Some habitat responses of the large water-strider, Gerris remigis. **90**, liii, 394-414 (cont.). **Severin, H. H. P.**—Notes on the behavior of Eutettix tenella. **12**, xii, 303-8.

Drake, C. J.—A n. sp. of Velia from Florida. **39**, iii, 1-2. **Gibson, E. H.**—A review of the leafhoppers of the genus Gyphona north of Mexico. **50**, lvi, 87-100. **McAtee, W. L.**—Key to the Nearctic sps. of Piesmidae. **19**, xiv, 80-93. **Van Duzee, E. P.**—Hemiptera (Rept., Canadian Arctic Exp., 1913-18, iii, F.).

LEPIDOPTERA. Braun, A. F.—The synonymy of Helice and Theisoa (Micro-L.). **4**, 1919, 201-3. **Chapais, J. C.**—La lycie vulgaire (Nat. Canadien, xlvi, 25-7). **Hall, A.**—Descriptions of 12 new Nymphaline butterflies. **9**, 1919, 195-200. **Kaye, W. J.**—New sps. and gen. of Nymphalidae Syntomidae, and Sphingidae in the Joicey Collection. **11**, iv, 84-94. **Lewis, G.**—On the taxonomy of the Histeridae. **8**, 1919, 173-4. **Reiff, W.**—Notes on plate No. 3 (Heliconius, Papilio, Catocala). **17**, iii, 60-2. **Riley, N. D.**—Some new Rhopalocera from Brazil. **9**, 1919, 181-6 (cont.). **Rummel, C.**—Catocala tristis and gracilis on high-bush blueberry. **19**, xiv, 103. **Tillyard, R. J.**—On the morphology and systematic position of the family Micropterygidae. **73**, xliv, 95-136.

DIPTERA. Herms, W. B.—Occurrence of malaria and anopheline mosquitoes in northern California (U. S. Pub. Health Service, Reprint No. 541). **Johnson, C. W.**—Revised list of D. of Jamaica. **62**, xli, 421-49. **Kieffer, J. J.**—Observations sur les Chironomides decrits par J. R. Malloch. **20**, 1919, 191-4. **Malloch, J. R.**—The limits of the dipterous group Calyptrata. **19**, xiv, 111-12. **Roubaud, E.**—Antagonisme du betail et de l'homme dans la nutrition sanguine de l'Anopheles maculipennis. **69**, clxix, 483-6.

Alexander, C. P.—New Nearctic crane-flies, VIII. **4**, 1919, 191-9. New Nearctic sps. of the genus Erioptera (Tipulidae). **19**, xiv, 104-8. **Alexander, Dyar & Malloch**—Diptera (Rept., Canadian Arctic Exp., 1913-18, iii, C.). **Cole & Lovett**—New Oregon D. **61**, ix, 221-55. **Van Duzee, M. C.**—Key to the North American sps. of Medeterus, with descriptions of n. sps. **61**, ix, 257-70.

COLEOPTERA. Bickhardt, H.—Histeridae. **40**, 166a-b. **Blackman, M. W.**—Two bark-beetles attacking the trunks of white pine trees. **5**, xxvi, 85-96. **Burke, H. E.**—Biological notes on.... Chrysobothris femorata, and.....C. mali. **12**, xii, 326-30. **Champion, G. C.**—Another note on the habits of Melanophila acuminata. **8**, 1919, 177-8. **Crampton, G. C.**—Notes on the ancestry of the C. **13**, xi, 49-54. **Fenyes, A.**—Staphylinidae, subfam. Aleocharinae. **40**, 173a. **Grouvelle, A.**—Memoires entomologiques. Etudes sur les Coleopteres. Fasc. 1-2. (Soc. Ent. France). **Lameere, A.**—Cerambycidae, subfam. Prioninae. **40**, 172. **Matheson, R.**—Notes on Pelenomis sulcicollis (Curculionidae). **4**, 1919, 199-201. **de Peyerimhoff, P.**—Un nouveau type d'insectes Strepsipteres. **20**, 1919, 162-73. **Pic, M.**—Notes sur le genre Astylus, et description de deux esp. nov. (Melyridae). **20**, 1919, 188-90. **Weiss, H. B.**—Notes on Sulcacis lengi and Orchesia castanea, breeding in fungi. **4**, 1919, 203-4.

Blatchley, W. S.—Insects of Florida. Supplementary notes on the water beetles. **62**, xli, 305-22. **Fall, H. C.**—New C., VIII. **4**, 1919, 212-16.

HYMENOPTERA. Bordas, L.—Considerations generales sur les glandes venimeuses des H. terebrants. **32**, 1919, 94-6. **Brues, C. T.**—A n. sp. of the genus Scleroderma from the Galapagos Islands. **61**, ii, 309-10. **Desey, A.**—Instinct et intelligence experiences sur l'ammophile. **33**, lix, 86-95. **Wheeler, W. M.**—Ants of the Galapagos Islands. Ants of Cocos Island. **61**, ii, 259-308.

Banks, N.—The Psammocharidae of western N. A. **79**, lxiii, 229-48. **Bridwell, J. C.**—Miscellaneous notes on H., with descriptions of n. gen. & sps. [mostly Hawaiian]. **37**, iv, 109-165. **Cushman, R. A.**—Notes on certain genera of ichneumon flies, with descriptions of a new gen. and 4 n. sps. **50**, lvi, 373-82. **Phillips & Emery**—A revision of the chalcid flies of the genus Harmolita of America north of Mexico. **50**, lv, 433-71. **Stevens, O. A.**—Pangurgine bees of North Dakota and a new Epeolus. **4**, 1919, 205-10. **Timberlake, P. H.**—Revision of the parasitic chalcidoid flies of the genera Homalotylus, and Isodromus, with descriptions. **50**, lvi, 133-94. **Wheeler, W. M.**—A new paper-making Cremastogaster from the southeastern U. S. Ants of Tobago Island. **5**, xxvi, 107-12; 113.

An Investigation of the Louse Problem. By William Moore, Associate Professor of Entomology in the University of Minnesota, and Arthur Douglass Hirschfelder, Professor of Pharmacology in the same. Research Publications, Univ. Minn., viii, No. 4, July, 1919. 86 pp., 2 figs., 16 tables.—A paper growing out of the recent war. Although four-fifths of its pages are devoted to measures for checking or destroying the clothes or body louse (*Pediculus corporis*), a number of biological observations, some confirmatory, others contradictory, of the results of previous investigators occupy the early parts. The authors' experiments were conducted on lice raised in an incubator at 28-32 deg. C. and a relative humidity of 70-80 per cent., with two feedings on human volunteers per day. In dealing with the pathological conditions produced by lice "which had never bitten diseased individuals," the possibility that the insects were hereditarily infected is not considered. The effects of ordinary laundry practice as destructive of lice and nits were investigated and some suggestions for certainty of death are offered. The most valuable part of the paper deals with the action of pediculicides, especially those suitable for impregnation of underwear, and is pervaded throughout with the endeavor to determine the principles governing the toxicity of various substances, in line with Prof. Moore's researches published in the *Journal of Agricultural Research* for 1917 and 1918, instead of experimenting with all sorts of materials by a hit-or-miss empirical method.—P. P. C. (*Advt.*)

Seventeenth Report of the State Entomologist of Minnesota. By A. G. Ruggles. St. Paul, Minn., Dec. 1, 1918. Rec'd. May 5, 1919. —In addition to a general report on insect conditions in 1918, and articles of economic interest on an oak twig girdler, *Agrilus arcuatus* Say and var. *torquatus* Lec., "the worst pest of black oaks discovered in recent years," the relative values of different arsenic salts for potato spraying, the carpenter ant as a destroyer of sound wood (of the white cedar), the occurrence of *Drosophila* in bottled milk, methods of combating the confused flour beetle and the clover seed chalcid, by Messrs. Ruggles, Graham, Riley, Chapman and Williamson, this volume contains three longer papers of taxonomic and geographical importance: a synopsis of the tribes and higher groups of the Aphididae by O. W. Oestlund, and preliminary reports on the Trombidiidae, and on the Hymenoptera, of Minnesota, by C. W. Howard and F. L. Washburn respectively. Mr. Howard has not identified the chigger, which not only attacks man but also birds, as the prairie chicken, quail and pheasants, in Minnesota, farther than that according to Oudemans it should be the larva of a *Microtrombidium*. Prof. Washburn gives professedly incomplete lists of the Hymenoptera actually identified from the State, accompanied by three four-color plates and excellent half-tone text figures.—P. P. C. (*Advt.*)

ELCO

When we first used this word, it meant Elco Card Index Mounts only. The word Elco, as now used, applies to our entire line of Lepidoptera Specialties and Supplies, made and sold by us. It is our intention to increase this line as fast as it is practical to do so.

The items ready for business are listed below. A number of others will be ready during the winter.

THE ELCO LINE

Dept. 1—Stock Department, Lepidoptera—Papered or pinned; mounted in Elco Art Mounts, Riker Mounts, Elco Wing Mounts. Prices on application.

Dept. 2—Art Department, Elco Butterfly Art Mounts
5 x 6 inches, $1.25; 8 x 12 inches, $2.50; 12 x 16 inches, $5.00

Dept. 3—Supply Department, Elco Labels
Ruled, white, ¾ x 1¼, 65c. per 1000
Plain white, gummed, ¾ x 1¼, 50c. per 1000
Plain, bristol board, 65c. per 1000

Elco Index Tabs—Eight colors gummed, ¼ x ⅞, for color classification of records and specimens, 25c. per 1000, assorted.

Elco Celluloid Spreading Strips—Transparent, assorted lengths, 10c. per 1000

Elco Card Index Specimen Mounts
3 x 5, 10c. each; 4 x 6, 15c. each; 5 x 8, 20c. each.

Elco Card Index Wing Mounts—Prices of sets on application.

Dept. 4—Collector's Service Department—Information in regard to this Department on request.

S. C. CARPENTER, Lepidoptera, 62 South Whitney St., Hartford, Conn.

THIS SPACE FOR RENT

NEW ARRIVALS

From Columbia, So. America:

OVER 10,000 BUTTERFLIES, INCLUDING

Morpho cypris
" sulkowskyi
Morpho amathonte
Caligo spp.

From Cuba:

1500 BUTTERFLIES AND MOTHS, INCLUDING

Papilio columbus
" andraemon
" celadon
" devilliersi
Urania boisduvali
Erinyis guttalaris
Protoparce brontes, etc.

From Venezuela:

Over 5000 Lepidoptera
200 Dynastes hercules

From New Guinea:

2000 Coleoptera
200 Orthoptera

From Assam, India:

1200 BUTTERFLIES AND MOTHS, INCLUDING

Papilio arcturus
" philoxenus
Kallima inachis
Brahmaea wallachi

And Many Other Showy Species

From Tibet (Bhutan)

Armandia lidderdalii
Parnassius hardwicki

CATALOGUES OF ENTOMOLOGICAL SUPPLIES AND SPECIMENS ON APPLICATION

If interested kindly send your list of desiderata for further information to

THE KNY-SCHEERER CORPORATION

Department of Natural Science
G. Lagai, Ph.D.

New York
404-410 W. 27th Street

SUBSCRIPTIONS FOR 1920 ARE NOW DUE

(SEE INSIDE OF COVER)

DECEMBER, 1919.

ENTOMOLOGICAL NEWS

Vol. XXX. No. 10.

Smithsonian Institution
DEC 23 1919
National Museum

Thaddeus William Harris
1795-1856.

PHILIP P. CALVERT, Ph.D., Editor.
E. T. CRESSON, Jr., Associate Editor.

HENRY SKINNER, M.D., Sc.D., Editor Emeritus.

ADVISORY COMMITTEE:

EZRA T. CRESSON, J. A. G. REHN,
PHILIP LAURENT, H. W. WENZEL.

PHILADELPHIA:
THE ACADEMY OF NATURAL SCIENCES,
LOGAN SQUARE.

Entered at the Philadelphia Post-Office as Second-Class Matter.
Acceptance for mailing at the special rate of postage provided in Section 1103
Act of October 3, 1917, authorized on July 19, 1918.

ENTOMOLOGICAL NEWS

published monthly, **excepting August and September,** in charge of the Entomological Section of The Academy of Natural Sciences, Philadelphia, and The American Entomological Society.

ANNUAL SUBSCRIPTION, $2.00 IN ADVANCE.

FOREIGN SUBSCRIPTIONS, $2.20 IN ADVANCE

SINGLE COPIES 24 CENTS.

ADVERTISING RATES: Full width of page. Payments in advance.

One issue,	one inch,	$ 1.20,	two inches,	$ 2.40,	half page,	$ 4.00,	full page, $ 8.00
Five issues,	"	5.50,	"	11.00,	"	17.50,	" 35.00
Ten issues	"	11.00,	"	20.00,	"	35.00,	" 70.00

☞All remittances, and communications regarding subscriptions, non-receipt of the NEWS or of reprints, and requests for sample copies, should be addressed to ENTOMOLOGICAL NEWS, 1900 Race Street, Philadelphia, Pa. *All Checks and Money Orders to be made payable to the* ENTOMOLOGICAL NEWS.

☞All complaints regarding non-receipt of issues of the NEWS should be presented within three months from date of mailing of the issue. After that time the numbers will be furnished only at the regular rate for single copies.

☞Not more than two issues will be replaced gratis through loss, in transit or in change of address, unless such have been registered, at the subscriber's expense.

☞Address all other communications to the editor, Dr. P. P. Calvert, Zoological Laboratory, University of Pennsylvania, Philadelphia, Pa., from September 15th to June 15th, or at the Academy of Natural Sciences, from June 15th to September 15th.

ADVICE TO OUR SUBSCRIBERS—PLEASE NOTE THAT

If your copy of this issue contains a yellow renewal blank it is a notice that your subscription has expired and renewal has not been received at this mailing. No receipts for subscriptions will be given unless specially desired.

SPECIAL NOTICE TO AUTHORS

Owing to increased cost of labor and materials, no illustrations will be published in the NEWS during 1920, except where authors furnish the necessary blocks, or pay in advance the cost of making blocks, and pay for the cost of printing plates. Information as to the cost will be furnished in each case on application to the Editor. Blocks furnished or paid for by authors will, of course, be returned to authors, after publication, if desired.

☞ The printer of the NEWS will furnish reprints of articles over and above the twenty-five given free at the following rates: Each printed page or fraction thereof, twenty-five copies, 15 cents; each half tone plate, twenty-five copies, 20 cents; each plate of line cuts, twenty-five copies, 15 cents; greater numbers of copies will be at the corresponding multiples of these rates.

500 PIN-LABELS, 25 CENTS! All Alike on a Strip.

Smallest Type. Pure White Ledger Paper. Not Over 4 Lines or 30 Characters (13 to a Line). Additional characters 1c. each. per Line, per 500, Trimmed.

C. V. BLACKBURN, 12 Pine St., STONEHAM, MASS., U. S. A.

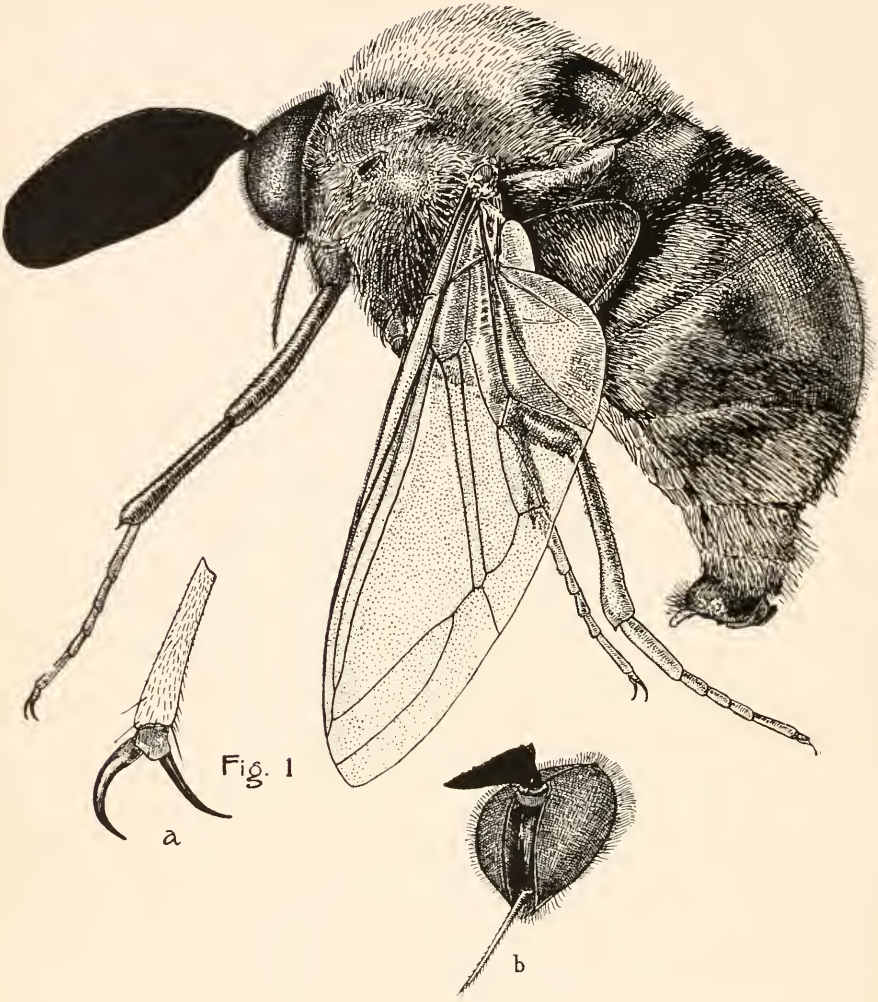


Fig. 1

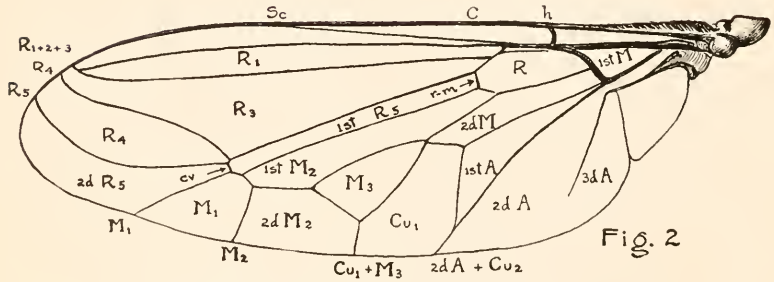


Fig. 2

1. CAMPOSELLA INSIGNATA, N. GEN. ET SP. 2. LASIA SP.—COLE.

Smithsonian
DEC 23 1919
National Museum

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

THE ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XXX. DECEMBER, 1919. NO. 10

CONTENTS:

Cole—A new Genus in the Dipterous Family Cyrtidae from South America 271
Ferris—A New Species of Pseudodiaspis (Hemiptera; Coccidae)..... 275
Nicolay—Additions to Insects of New Jersey, No. 7..... 276
Reinhard—Preliminary Notes on Texas Tachinidae (Diptera)..... 279
Cockerell—The Bees of the Rocky Mountain National Park (Hymen.) 286
Williamson—Variation in Color Pattern of the Dragonfly Gomphus crassus (Odonata)..... 294
Annual Meetings of Entomologists.... 296
Skinner—Hesperia syrichtus and montivagus (Lep.)..... 297
Bradley—A new Tachytes from Georgia (Hymenop.: Larridae) 298
Ireland—Sugaring for Moths..... 298
Editorial—After Thirty Years..... 299
A Loved and Respected Entomologist 300
Davis—Preservatives for Plants and Insects..... 300
Entomological Literature 301
Notice of Oberthur's Études de Lepidoptérologie Comparée..... 304
Doings of Societies—Feldman Collecting Social (Dip., Coleop., Lepid.)... 304
Correction..... 304

A new Genus in the Dipterous Family Cyrtidae from South America.

By F. R. COLE, U. S. Bureau of Entomology.

(Plate XI)

In material received at the United States National Museum from Prof. F. Campos, of the Museum in Guayaquil, Ecuador, there was included a remarkable new Cyrtid. Through the kindness of Dr. J. M. Aldrich, of the National Museum, I am able to describe and figure this interesting specimen. Among other characters there is an almost unbelievable development of the antennae, and it is small wonder that some of the entomologists at the National Museum thought they were dreaming when they came across it in the collection.

CAMPOSELLA n. gen.

Head hemispherical, the occiput but little swollen. Eyes pilose, contiguous from vertex to base of antennae and widely separated from this point to the mouth opening, the space being deeply excavated, although the proboscis is quite rudimentary. Antennae in male about four times the length of the head; the first joint sunk in the head, the second ring-like

and short, the third enormous, about as wide as the vertical diameter of the head, flattened and blade-like. Proboscis about as long as height of head, small, cylindrical, pointed and with fine hairs on the surface; it is not rigid as in *Lasia* and *Eulonchus*, and is clearly rudimentary, not being adapted for feeding. Palpi are absent. The ocellar tubercle is rudimentary and there are no ocelli.

Thorax large and inflated as in *Lasia*, quite thickly pilose, the prothoracic lobes and upper pleura inflated and quite prominent. Upper surface of scutellum rather flattened. Postalar callosities of medium size. Squamae large and of thin texture, the surface and margins pilose. Legs of normal stoutness, all the tibiae enlarged at the tips and with a spur-like projection above. Tarsi slightly compressed laterally. Claws quite long and so formed that they can be brought together along the inner surfaces. *Pulvilli and empodia absent.*

Abdomen large and inflated in appearance, although the venter is flattened. Pile of abdomen quite noticeable. Genitalia similar to those of *Eulonchus*. Wing venation very near that of *Lasia;* the lower branch of the fourth vein has disappeared, however, and the upper branch of the third vein ends in the first just beyond its juncture with the second. In *Lasia* this is a variable character, but is constant in the species as far as known.

Genotype: *Camposella insignata* n. sp.

C. insignata n. sp.

♂.—Length 13 mm., length of antennae 5 mm. Head and eyes black with black pile. Eyes contiguous above and widely separated below the antennae. Antennae contiguous at base, first joint scarcely visible and yellow, second joint small, black and ring-like. The third antennal joint has a rounded, short basal portion which expands into a very large surface, flattened, very thin and rounded at the end. The third joint is about four times as long as the head and about 6-10 as wide as long; it is velvety black and destitute of pile. Proboscis rudimentary, slender, cylindrical and pointed, covered with very short black pile. Face black, deeply excavated below the antennae (see Pl. XI, fig. 1b). Occiput slightly swollen, the cheeks shining black and pointed below the eyes. Ocellar tubercle rudimentary, black, with a central depression which is thinly black pilose; ocelli absent.

Thorax large and inflated, brownish black in color, the anterior half thickly golden pilose with a few black hairs along the median line. Posterior half of the dorsum (more or less abraded in this specimen) black pilose, as are the postalar callosities. Scutellum colored as the thorax, flattened, of nearly uniform width, with black pile except in the center. Upper pleura inflated, yellow pilose above, black below. Squamae smoky hyaline, the surface and border with short black pile. Coxae blackish brown, the front pair yellowish pilose, the others black pilose. Femora blackish brown with black pile, paler at base and tip. Tibiae blackish, yellowish at tip, which is enlarged and with a slender spur above. Tarsi yellow, the claws yellow at base. Tibiae and tarsi with very fine, short yellow pile. *No empodia or pulvilli present.*

Abdomen very broad and inflated, but the venter flat, the general shape being very near that of *Lasia*, in which the fifth segment is much smaller than the fourth. The first three abdominal segments and basal half of fourth with rather short black pile, posterior to this the pile is golden yellow. Ground color of abdomen brownish black, near a dark mahogany color. Venter clothed with reclinate golden yellow pile. Genitalia blackish marked with yellow, with yellowish pile.

Wings brownish hyaline, a little darker near the base. Veins blackish. Venation nearly identical with that of *Lasia* (see Pl. XI, fig. 2). As in some species of *Lasia* the upper branch of the third vein (R4) ends in the first (R1+2+3) beyond its junction with the second. The lower branch of the fourth vein is missing.

This remarkable species would go in the subfamily Panopinae. Some of the genera in this group have a rudimentary proboscis, such as *Ocnaea* and *Astomella*. It has several characters in common with *Lasia*, the general shape of the body being strikingly near that genus and the venation is almost identical. The Leptidae, Nemestrinidae and Cyrtidae are separated from other families by having the empodia developed pulvilliform and it is remarkable that this species should have no sign of pulvilli or empodia. The claws close together along the inner edges as in some of the Asilidae, such as *Leptogaster*, some species of which have not even the usual bristle-like empodia. This would seem to be a very important and deep-seated character, but on account of its close resemblance to the genus *Lasia* it would not seem advisable to erect a new subfamily to receive it. Owing to the

great variation in this group of insects, characters which might be considered generic in other families are of only specific value here. Ordinarily the absence of pulvilli and empodia would place it in a new family, but it is clearly a Cyrtid, and there are no corresponding changes elsewhere in the organism. Most species of *Anthrax* lack pulvilli, but some have them, so this is a variable character in the nearly related Bombyliidae.

The antennae are very remarkable, but as we know only the male they may be a secondary sexual character. In the genus *Eulonchus* the third antennal joint is greatly enlarged and in *Ocnaea* (in the subfamily Panopinae) there are several species with a large third antennal joint. In *Ocnaea schwarzi* Cole from Cuba the third antennal joint is large and laterally compressed. In the Cyrtidae the two sexes are almost identical in appearance and if the remarkable antennae of *Camposella* are a male ornamental character it will be the first instance of this kind in the Cyrtidae. The unusual development of the antennae gives a great sensitive surface and it may be that this is utilized by the male in locating the female. The overdevelopment of one organ may be at the expense of another, and in this case the ocellar tubercle is rudimentary and the ocelli absent, but this is another variable character in the Cyrtidae.

In this species we have a connecting link between *Lasia* and *Ocnaea*. Parasitism has undoubtedly modified other genera in the Cyrtidae and we see here a changing species. The ancestral type was near *Lasia* and *Eulonchus*, both with a long proboscis; here the proboscis is aborted and the lower branch of the fourth vein has disappeared. It is undoubtedly a degenerate offshoot from the primitive type, the genus *Panops* in Australia being another such branch.

EXPLANATION OF PLATE XI.

Fig. 1. *Camposella insignata* n. gen. et sp. *a*. Last tarsal joint and claws, showing absence of pulvilli. *b*. Drawing showing excavated face and rudimentary proboscis. Most of the antennae are cut away in this view of the head.

Fig. 2. Wing of *Lasia* sp., nomenclature according to the Comstock system.

A New Species of Pseudodiaspis (Hemiptera; Coccidae).

By G. F. Ferris, Stanford University, California.

The exact nature of the genus *Pseudodiaspis*, as I have elsewhere[1] pointed out, is doubtful, but I have previously used the genus for the reception of certain species of a more or less Diaspis-like type in which the circumgenital pores are lacking and the gland spines few or absent. As at present constituted the genus is represented only in the southwestern part of the United States and in Mexico. I am here describing a new species from this area, which I likewise refer for the present to this genus.

Pseudodiaspis multipora n. sp.

Type, host and locality. From an herbarium specimen of *Phoradendron flavescens* (from oak), Julian, San Diego County, California. Type in the Stanford Collection of Coccidae.

Pseudodiaspis multipora n. sp.; pygidium.

[1] Ferris, G. F. A Contribution to the Knowledge of the Coccidae of Southwestern United States. *Stanford University Publications, University Series.* (1919.)

Scale. Scale of the female white, rather high convex, circular, with the exuviae central, the second exuvia covered with secretion, the first exposed and of a silvery color. Ventral scale quite thick, attached at its margin to the dorsal scale. Scale of male not observed.

♀. Length .8 mm. Of the usual turbinate form. Derm membranous throughout except for the large and heavily chitinized pygidium. Abdominal segments projecting slightly at the lateral margins, without marginal gland spines but with numerous, small submarginal ducts and a few such ducts on the dorsum.

Pygidium presenting a furrowed appearance. Anal opening at about the center. Median lobes alone well developed, widely separated, prominent, broad and with the tips rounded and minutely crenulate. Second and third pairs of lobes represented merely by low prominences. Gland spines wanting, except for a very small spine between the first and second lobes. Spines small; two between the median lobes; one both dorsally and ventrally at the outer, basal angle of both the first and second lobes and two or three beyond these. Tubular ducts numerous, scattered, those of the margin no larger than those of the dorsum. The arrangement may best be explained by the figure. On the ventral aspect there are on each side three rows of small ducts. Vaginal orifice directly beneath the anal orifice.

Notes. This is a rather peculiar species, perhaps most closely resembling *P. condaliae* Ferris (ref. cited), but differing in many respects, especially in not having the cephalothorax produced laterally and in the deeply furrowed appearance of the pygidium.

Additions to Insects of New Jersey No. 7

By Alan S. Nicolay, New Brunswick, New Jersey.

Since the publication of list No. 6* by Mr. H. B. Weiss the following records have been secured. Those followed by (Dcke.) were turned over to me by Mr. Weiss who obtained them through the courtesy of Prof. J. G. Sanders after the death of Mr. V. A. E. Daecke. Since the publication of the 1909 list by Smith, Mr. Daecke kept track of various additions and corrections as evinced by his notes. It was thought advisable, however, to omit his corrections from this list and to use only the additions.

* Ent. News, vol. xxix, pp. 309-312.

ODONATA.

Aeshna canadensis E. M. Wlk. Riverton, Sept. 22 (Dcke.).

HOMOPTERA.

Idiocerus maculipennis Fitch. Jamesburg, July 4 (Dcke.).

Psyllia cephalica Craw. Hammonton, May 21; on hornbeam (Nicolay & Weiss).

HEMIPTERA.

Corizus bohemanii Sign. Merchantville, July 7 (Dcke.).

Acalypta lillianis Bueno. Lakehurst, May 2 (Barber).

Corythucha mali Gibson. Lakehurst, May 24; on apple (Barber).

Corythucha salicis O. & D. Ramsey, May 21; on willow (Barber).

COLEOPTERA.

Gyrohypnus fusciceps Lec. Riverton, May 3 (Dcke.).

Chalcophora fortis Lec. New Brunswick, June 16; on dead white pine along Raritan River (West).

Poecilonota cyanipes var. **erecta** Gory. New Jersey (Nicolay collection). Note.—*P. cyanipes* records should be referred to this variety. The records of *P. thurcura* Say from New Jersey are undoubtedly misidentifications and the species should be removed from the list.

Agrilus pensus Horn. Newfoundland, July 4 (Nicolay).

Xestocis levettei Casey. Milltown, May 18; Union, May 23; Monmouth Jc., May 30; in *Polyporus versicolor* and *Fomes aplanatus* (West & Weiss).

Cis curtula Casey. Monmouth Jc., May 30, June 10; in *Polyporus pergamenus* (Weiss & West).

Sulcacis lengi Dury. Princeton Jc.; breeds in *Polyporus versicolor, gilvus* and *hirsutus*, also *Lenzites betulina*. Overwinters as adult and larva (Weiss & West).

Xylotrechus aceris Fisher. Rutherford, August 16; one specimen resting on maple leaf in nursery (Nicolay).

Zeugophora scutellaris Suffr. Arlington, June 23-August; common on poplar in a nursery, doing some damage. A European species (Nicolay).

Chaetocnema quadricollis Schwarz. Hammonton, July 8; Rutherford, June-Sept., Eatontown, August 28; Westville, Little Silver, South Amboy; on hibiscus (Dickerson & Weiss).

Apion hibisci Fall. Arlington, Rutherford; galls on petioles of marsh mallow (Dickerson & Weiss).

LEPIDOPTERA.

Cosmia (Calymnia) orina Gn. Orange Mts.; larvae on oak, May 10; adults June 17 (Lemmer).

Tinea cloacella Haw. Matawan, New Brunswick; overwinters as larva, breeds in *Polyporus sulphureus* and *tsugae* (Weiss & West).

HYMENOPTERA.

Spathius trifasciatus Riley. Wenonah, July 15 (Dcke.).

Ichneumon inurbanus Cress. Manumuskin, September 20 (Dcke.).

Stomatoceras unipunctatipennis var. **americensis** Gir. Camden Co. (Fox, Ent. News, vol. xxix, p. 127).

Closterocerus cinctipennis Ashm. New Brunswick, Asbury, High Bridge, July. Parasitic upon eggs and larvae of *Brachys ovata* (Weiss).

Exallonyx grandis Brues. Ramsey, August 22 (Jour. N. Y. Ent. Soc., vol. xxvii, p. 17).

Andronicus truncata Cress. Tom's River, July 12 (Dcke.).

Bombus bimaculatus Cress. Brown's Mills, June 17 (Dcke.).

Metopius pollinctorius Say. Elizabeth; reared from a Luna moth cocoon (Felt).

Ephedrus nitidus Gahan. New Brunswick; bred from cabbage aphis.

DIPTERA.

Chrysopila proxima Wlk. Wenonah, May 30 (Dcke.).

Dasyllis cinerea Back. Brown's Mills, May 19 (Dcke.).

Psilopodinus comatus Loew. Orange Mts., July 1 (Wdt.).

Argyra calceata Loew. Fort Lee, July 4 (Wdt.).

Neurigona maculata V. D. Forest Hill, August (Wdt.).

Neurigona floridula var. **infuscata**, V. D. Wenonah, June 22 (Dcke.).

Dolichopus marginatus Ald. Barnegat City, August 12 (Harbeck.).

Tachytrechus laticrus Coq. Manahawken, July 30 (Ent. News, vol. xxix, p. 46).

Plagioneurus univittatus Loew. Cape May, August 9 (Dcke.).

Eumerus strigatus Fallen. (The lunate onion fly). Rutherford Riverton, Orange; all summer and occasionally in greenhouses during the winter. A European species now common in New Jersey; larvae live in onions and bulbs, sometimes causing serious injury (Nicolay).

Spilomyia quadrifasciata Say. Fort Lee, September 3 (Bequaert).

Crioprora cyanogaster Loew. Palisades, March 31; rare on pussywillow (Nicolay).

Pipiza pistica Williston. Lakehurst, June 20 (Nicolay).

Myiolepta nigra Loew. Lambertville, April 19; flying along road like bee (Nicolay).

Chilosia cyanescens Loew. New Brunswick, June 15 (Nicolay).

Xanthogramma felix O. S. Riverton, June 15 (Dcke.).

Helophilus bilinearis Williston. Secaucus, April 17-May 7; moderately abundant on dogwood and other blossoms (Nicolay).

Chrysochlamys buccata Loew. Malaga, April 26 (Nicolay).
Criorhina notata Wied. Manumuskin, May 19 (Dcke.).
Physocephala castanoptera Loew. Caldwell, August 5 (Nicolay).
Trichopoda lanipes Fabr. Mt. Airy, Philadelphia, Pa., August 23 (Laurent).
Clausicella tarsalis Coq. Lucaston, May 30 (Dcke.).
Hypostena nitens Coq. Stone Harbor, July 29 (Dcke.).
Phorocera tortricis Coq. Lucaston, August 6 (Dcke.).
Tachina rustica Fall. Forest Hill, August (Wdt.).
Masicera chaetoneura Coq. Forest Hill, June (Wdt.).
Masicera festinans Meig. Forest Hill, June (Wdt.).
Sturmia fraudulenta v. d. Wulp. Brown's Mills, May 21 (Dcke.).
Schizotachina convecta Wlk. Lucaston, Sept. 3 (Dcke.).
Theresia canescens Wlk. DaCosta, June 29 (Dcke.).
Helomyza latericia Loew. Lucaston, September 7 (Dcke.).
Ophthalmomyia lacteipennis Loew. Brown's Mills, June 22 (Dcke.).
Camptoprosopella verticalis Loew. DaCosta, June 3 (Dcke.).

Preliminary Notes on Texas Tachinidae (Diptera).

By H. J. Reinhard, Entomologist, Texas Experiment Station, College Station, Texas.

The Tachinidae listed in this paper were all collected on the campus of the Agricultural and Mechanical College, or in the immediate vicinity of College Station, Texas, unless otherwise mentioned. The relative abundance of flies in this locality, belonging to the family, was the impetus to give them more than casual attention. Three years of intermittent collecting have resulted in a large number of specimens being taken, many of which have not been heretofore recorded from this state. The purpose of these collections was to determine the relative abundance of the various species with a view to ascertain their economic importance in a more comprehensive manner at some future time.

All plant determinations were made through the kindness of Messrs. H. Ness, Horticulturist, and H. B. Parks, Apiculturist, of the Texas Agriculture Experiment Station.

Archytas analis Fabricus. This is one of the most common species of this locality. It appears in early February and is very abundant throughout the spring and fall months. Less common in

midsummer. 73 specimens were taken in 10 minutes on November 9, 1917. In early spring collections were made largely from broom weed, *Amphiachyris dracunculoides* Nutt.; in the fall it was common on bitter weed, *Helenium tenuifolium* Nutt., wild aster, *Aster lateriflorus* Britton. Also common on *Rudbeckia bicolor* Nutt.; sweet clover, *Melilotus alba* Desv.; Prairie cacia, *Cecuan illinoensis* Kuntze, and many others. Reported by Parks as abundant in wheat fields infested by army worms in North Texas. Bred from army worm collected by A. P. Swallow, at Denton, Texas; fly issued June, 1919. A series of several hundred specimens taken, which vary from 7 to 15 mm. in size. Also collected in Knox, Foard and Dallas Counties, Texas. Previously reported from Waco, Texas, by Coquillett, Revis. Tachin. N. A. 1897, p. 142.

Belvosia bifasciata Fabricus. A series of 108 specimens taken on one afternoon, May 3, at *Stillingia sylvatica* L. A few specimens collected from prickly ash, *Xanthoxylum clava* Herculis, sweet clover, *Melilotus alba* Desv., and *Baccharius haliumfolia* L. Two specimens received from Center Point, Kerr County, Texas, and has been collected at Navasota, Texas, by Parks. This is one of the robust and more attractive species in this vicinity. Very conspicuous in nature, by its black body and wings, and deep yellow on last two abdominal segments. Macrochaetae abundant and well developed, varying somewhat in numbers and arrangement. The series is quite uniform in size, the smallest specimen measuring 11 mm. and the largest 16 mm. in length. Collecting dates range from April 17 to October 1. Reported from Waco, Texas, by Coquillett, Revis. Tachin. N. A. 1897, p. 84.

Cistogaster immaculata Macquart. Adults collected from blossom of *Ptilimnium capillaceum* Hollick. This species is rather sluggish in its movements. Several specimens taken by sweeping grass. Not abundant but persistently present throughout the spring and summer. Probably a parasite of some Hemipterous host. Dr. Aldrich in Ann. Ent. Soc. Amer., Vol. 8, March, 1915, p. 81, states that there is no trustworthy breeding record. Abdomen of male yellow and female black, destitute of stout macrochaetae. A series of twenty-six specimens taken, dates ranging from April 7 to November 11. Reported from Texas by Coquillett, Revis. Tachin. N. A. 1897, p. 43.

Chaetogaedia analis v. d. Wulp. One male specimen collected by A. H. Hollinger in Hamilton County, Texas, May 15. The specimen was taken in connection with other species, in a wheat field heavily infested by army worms. This may indicate a host relationship for this species. It has been reported bred from *Heliophila unipuncta*. Not collected at College Station, Texas.

Celatoria diabroticae Shimer. A large series of specimens taken from flowers and sweeping grass. Abundant throughout the spring and summer. The specimens vary in size from 4 to 6 mm. The characters which serve to separate this species from *Tachinophyto floridensis* are obscure and the species may easily be confused. Coquillett's description appeared under the name of *Celatoria crawii*, Insect Life, Vol. 2, February, 1890, p. 235, and later it was placed in synonymy with *Celatoria diabroticae*. A few characters which serve to separate it from *Tachinophyto floridensis* may be mentioned here.

Eyes bare, face much receding below; antennae nearly as long as face, arista thickened on basal half. Scutellum with three pairs of marginal macrochaetae and a short discal pair, apical cell terminating nearly at extreme wing tip and closed in the margin, third vein with one strong bristle at base. This species is a parasite of *Diabrotica vittata* and *12-punctata*. Reported from College Station, Texas, by Coquillett, Revis. Tachin. N. A. 1897, p. 59.

Exorista pyste Walker. Common throughout the summer. Characterized by a high-pitched note in flight, not unlike *Winthemia quadripustulata*, which species it resembles in nature. Collected from various flowers and particularly from foliage near the ground. Also collected in Knox County, Texas. A parasite of Lepidoptera. Specimens vary greatly in size, ranging from 4 to 8 mm. in length. Previously reported from Tiger Mills, Texas, by Coquillett, Revis. Tachin. N. A. 1897, p. 93.

Frontina archippivora Williston. Not common, one male specimen taken in the insectary, May 4, 1918. Eight additional specimens collected from flowers of broom weed, *Amphiachyris dracunculoides* Nutt., in October, 1917. A moderately large species, the specimens are nearly uniform in size. Reported as a parasite of several species of caterpillars. Also collected in Knox County, Texas. Listed from Texas by Coquillett, Revis. Tachin. N. A. 1897, p. 106.

Gonia capitata DeGeer. In this locality this species is uniformly light yellow and more robust than the dark form of the north. Not abundant, most common in late summer and fall. Collected from a large number of wild flowers, most frequently on broom weed, *Amphiachyris dracunculoides* Nutt. Also collected in Wilbarger County, Texas, in May, 1919. A series of 34 specimens taken; all robust, nearly uniform in size, but with large variations in color markings. Collecting dates range from May 3 to November 11. Reported from Texas by Coquillett, Revis. Tachin. N. A. 1897, p. 133.

Heteropterina nasoni Coquillett. Not abundant, but persistently present throughout May, June and July. It has been reported as bred from a grasshopper, by W. R. Walton, Proc. U. S. N. M., 1914, Vol.

48, p. 181. A rather small, light colored species, abdomen marked with rows of black spots. In nature it resembles somewhat a species of Sarcophagidae. Several specimens captured in insectary. It has been taken by sweeping grass and from foliage near the ground. A series of 17 specimens show a great variation in size, the smallest measuring 3.5 and the largest 6 mm. in length. In some specimens the sides of the face are bare, in others distinctly hairy.

Metopia leucocephala Rossi. This is another small species, but more conspicuous with its silvery white shining face. A series of 37 specimens taken in May and June. Several specimens taken from bare ground, more common on low foliage. There is no published breeding record for this country, according to Dr. Aldrich, Ann. Ent. Soc. Amer., March, 1915, Vol. 8, No. 1, p. 83. Ranges in size from 4 to 7.5 mm. Previously recorded from Kennedy, Texas, by Coquillett, Revis. Tachin. N. A. 1897, p. 127.

Myiophasia aenea Wiedemann. A medium large, shiny black species, not abundant. More common in late summer and fall. Adults collected largely from bitter weed, *Helenium tenuifolium* Nutt. Collecting dates range from March to October. Species vary from 6 to 9 mm. in length.

Neopales doryphorae Riley. This species is abundant in the spring and summer. Adults collected from a large number of flowers and especially from foliage near the ground. A moderately large species nearly uniform in size ranging from 6 to 8 mm. in length. Collected also in Knox County, Texas, May, 1919.

A new genus, *Doryphorophaga*, for the reception of this species, was proposed by Dr. C. H. T. Townsend, Proc. Ent. Soc. Wash., Vol. 14, p. 164. W. R. Walton has already pointed out, in Proc. U. S. N. M., Vol. 48, 1914, p. 183, several reasons why he thinks the species should be retained in the genus *Neopales*. Mr. Walton's statement: "The eyes are thickly hairy in the male as a rule, those of the female being so nearly bare in some cases as to require the utmost care in order to see the hairs at all," has been found to be correct in specimens examined. He further states that "the intermediate segments of the abdomen seldom bear discal macrochaetae in either sex, and are almost invariably absent in the female." Examination of 144 specimens shows this statement to be correct only in part. Out of 36 females examined 6 had discal macrochaetae on the second and third abdominal segments,

11 with a weak pair of discal macrochaetae on the second segment and none on the third, and 19 without any discal macrochaetae. Examination of 108 males gave the following figures: 42 with discal macrochaetae on the second and third abdominal segments, 65 with discal macrochaetae on second segment only, and only 1 in which were absent on both second and third segments. Mr. Walton further states that the ventral carina exists, but only slightly developed and not in the sense that we find it in *Celatoria* or *Chaetopheps*, and this has been sustained upon examination of the entire series of 144 specimens. In conclusion he argues "that until further and more reliable external characters, especially in the case of the male, are discovered, it would seem expedient to retain this species in the genus *Neopales*, for the present."

Pachyophthalmus floridensis Townsend. A medium large species, almost entirely destitute of strong macrochaetae and with three black vittae on thorax gives it very much the appearance of a sarcophagid. Collected largely from broom weed, *Amphiachyris dracunculoides* Nutt. Frequently sits on foliage and grass near the ground. Not abundant. Collecting dates from July to October. Specimens vary from 6 to 9 mm. in length Collected at Waco, Texas, according to Coquillett, Revis. Tachin. N. A. 1897, p. 80.

Peleteria robusta Wiedemann. A robust species common in the spring and fall, much less prevalent during midsummer. The southern form of this species has more yellow on the sides of the abdomen and lacks the bluish tinge of the northern form. Considerable variation in color markings. Has been collected and reported by Parks as very abundant in wheat fields infested by the army worm in northwest Texas. It was bred from the army worm; the adult fly issued May 23, 1919. Specimens vary in size from 9 to 13 mm. Collected in Wilbarger and Foard Counties. Reported from Texas by Coquillett, Revis. Tachin. N. A. 1897, p. 140.

Phorocera claripennis Macquart. Very common throughout the year. Collected from March to November from a large number of plants. A parasite of Lepidoptera, and has been reported bred from a large number of species. Reared from army worm, which was collected in Hamilton County, Texas; the adult fly issued June 4, 1919. Specimens vary greatly in size, the largest measuring 12 and the

smallest 5 mm. in length. Collected in Knox County, Texas. Listed from Texas by Coquillett, Revis. Tachin. N. A. 1897, p. 102.

Plagia americana v. d. Wulp. A medium-sized, shiny black species. Most common in early spring. Collected frequently in low damp places from foliage near the ground. Rarely taken in midsummer. Quite uniform in size, varying from 6 to 9 mm. in length. Collected also in Knox County, Texas.

Plagiprospherysa parvipalpis v. d. Wulp. Common in the spring and summer. 17 specimens taken in the insectary in June and July. Collected from aphid-infested cotton and cucumber foliage. Specimens vary greatly in size, ranging from 4 to 8 mm. in length.

Senotainia rubriventris Macquart. Not very abundant but present throughout the year. Collecting dates range from March to November. Frequently collected from bare ground. Probably a parasite of some soil-burrowing host. Prof. Herbert Osborn observed this species entering the burrow of a pompilid wasp (Ohio Naturalist, Vol. 7, p. 38). The specimens vary from 4.5 to 8.5 mm. in length.

Senotainia trilineata v. d. Wulp. Abundant from April to October. Like the above species, it is most commonly collected from the ground and it probably parasitizes some similar soil-burrowing host. Dr. Aldrich, Ann. Ent. Soc. Amer., Vol. 8, March, 1915, p. 82, states, "Presumably they parasitize these (burrowing) Hymenoptera as their European congeners do, but none have been bred in this country." A large series of specimens taken, varying from 3 to 6 mm. in length. Listed from Texas by Coquillett, Revis. Tachin. N. A. 1897, p. 80.

Sturmia albifrons Walker. A medium large species, not frequently collected here, adults taken from low foliage. Specimens vary from 7 to 10 mm. in length. Reported from Paris and Waco, Texas, by Coquillett, Revis. Tachin. N. A. 1897, p. 110.

Sturmia distincta Weidemann. One of the more robust species of this genus. Rather common from July to October, but not abundant at any time. Frequently taken from cowpea foliage. Varies from 8 to 11 mm. in length. Previously reported from Palestine, Texas, by Coquillett, Revis. Tachin. N. A. 1897, p. 111.

Sturmia limata Coquillett. Not often collected. Smaller than either of the above species and may be recognized by the shiny black color of the last two abdominal segments. Several specimens taken from low foliage, one from *Baccharius heliumfolia* L. About uniform in size, measuring 6 to 7 mm. in length.

Tachinophyto floridensis Townsend. A common species, which has been collected from May to November. Taken from flowers and by sweeping grass. The species is small and varies in size from 4 to 7 mm. in length. It resembles *Celatoria diabroticae* very closely. A few characters which may serve to distinguish it are given here.

Eyes nearly bare, microscopically, sparsely hairy; face receding below, antennae usually not reaching the oral margin, arista thickened on basal 2-5; scutellum with three marginal and a shorter discal pair of macrochaetae, with an additional suberect apical pair, sometimes very small. Apical cell narrowly open and ending shortly before extreme wing tip. Third vein with at least two bristles near the base.

Tachinophyto dunningii Coquillett. An abundant, minute species, readily recognized by the shiny black abdomen with the narrow bases of last three segments white pollinose. Collected from flowers, but more frequently from low foliage. Common from May to October. Series of specimens about uniform in size, measuring 5 mm.

Tachinophyto vanderwulpi Townsend. A small species like the above. Much less abundant. Frequently taken in company with *Tachinophyto floridensis*, which species it resembles closely, although usually smaller. Collected largely from foliage near the ground. Specimens range from 4 to 5.5 mm. in length.

Trichophora ruficauda v. d. Wulp. Collected from April to November from foliage and flowers. Persistently common, but not abundant. Usually elongate, but some specimens are robust and resemble *Pelcteria robusta* very closely. Specimens range from 8 to 11 mm. in length. Listed from Texas, by Coquillett, Revis. Tachin. N. A. 1897, p. 139.

Winthemia quadripustulata Fabricus. Very abundant and widespread. Common throughout the year. Collected from many different flowers, but it can be more frequently taken from low foliage and grass. In flight it has a distinct high-pitched note. A long series of specimens show a great variation in color markings. The most common form has the sides of the abdomen yellow, but frequently yellow only, on the second and third segments. In several specimens the abdomen is wholly black except the last segment, which is yellow. A few others have the abdomen bright orange-yellow excepting a medium dorsal row of black spots. Also a great variation in size, specimens ranging from 5 to 12 mm. in length. Reported by Parks as very abundant in wheat fields infested by the army worm of northwest Texas. A parasite of Lepidoptera and reported as having been bred from a large number of species.

The Bees of the Rocky Mountain National Park (Hymenop.).

By T. D. A. Cockerell, Boulder, Colorado.

A large area in the most beautiful and interesting part of the Colorado Rocky Mountains has recently been set aside as a National Park. To this playground come many thousands of people every summer to enjoy the relatively cool climate, the mountain scenery, the plant and animal life. Mr. Enos Mills, of Longs Peak Inn, has written a number of excellent popular books, describing the country and giving his observations on the habits of bears, beavers and other animals. He has tried for many years to stimulate an intelligent interest in nature, while at the same time curbing that spirit of destruction which leads people to shoot the animals and pull up plants in a wholesale and reckless manner. Occasionally someone breaks the rules, but on the whole the behavior of visitors to the Park, at least in the vicinity of Longs Peak Inn, is excellent. The multitude, coming primarily for rest and recreation, finds itself in a new kind of school, where fresh impressions and ideas are received every hour. One must be extraordinarily dull not to return from such a holiday with new intellectual interests as well as increased physical vigor. The Park is new, and awaits development in various directions. One of the principal items on the program should be a Natural History Survey. The intensive and scientific study of such an area would produce results of the greatest interest to all biologists, and would make possible many interpretations of natural phenomena instructive to ordinary non-scientific visitors. The indiscriminate collecting of specimens should not be encouraged, but materials must be gathered in a systematic manner to determine the character and distribution of the biota. We should have a committee or commission to carry on the undertaking after the manner of the Clare Island Survey, the results of which have been published by the Royal Irish Academy. Following the technical investigations, the general results and more interesting

details should be re-interpreted in popular fashion for the use of the average citizen.

In the course of a week in the Park, during July, 1919, my wife and I collected bees. The series obtained evidently represents only a minority of the species actually existing in the area, but is worth recording. The names of the localities are abbreviated as follows:

(1) Canadian Zone.

L.—Long's Peak Inn. July 19 and 21.

T. S.—Twin Sisters Mountain, directly east of Long's Peak Inn. All the collecting was done on the lower slopes, in the Canadian Zone, July 23.*

L. P. T.—Long's Peak trail, July 18. Most of the collecting was done in the Canadian Zone, but a few specimens probably were from the Hudsonian.

(2) Hudsonian Zone.

H.—Hudsonian Zone on Long's Peak trail, July 22.

(3) Arctic-alpine Zone.

T. L.—Just above timber line on the Long's Peak trail, July 20. The two species from *Pentstemon* flowers were at timber line.

B.—Battle Mountain, well above timber line, July 20.

COLLETIDAE.

Colletes kincaidii Ckll. L., one ♂.

Colletes sp. L., one ♂.

Colletes sp. L., one ♀. This and the preceding are apparently new, but they may have been described in Professor Swenk's revision, not yet published.

PROSOPIDIDAE.

Prosopis personatella Ckll. L., 2 ♀.

Prosopis varifrons Cress. L., 2 ♂. H, 1 ♂, 4 ♀. L. P. T., 1 ♂.

Prosopis tridentula Ckll. L. P. T., 1 ♂.

Prosopis coloradensis Ckll. L., 2 ♀. These are considerably larger and more robust than *P. tuertonis* Ckll., generally considered to be the female of *coloradensis*. Possibly *tuertonis* is distinct after all, but I cannot assert this at present.

* On Twin Sisters, in an aspen grove, I took several specimens of the Tipulid fly *Ormosia cockerelli* (det. Alexander), a little yellow species described by Coquillett under *Rhypholophus* in 1901, from a single specimen which I took in the Hudsonian Zone in New Mexico. Mr. Alexander had never seen any but the type.

ANDRENIDAE.

Andrena birtwelli Ckll. T. S., 1 ♀ at *Potentilla*.

Andrena lewisii Ckll. T. S., 1 ♀ at *Rosa*.

Andrena moesticolor Vier. & Ckll. L. P. T., at *Potentilla*, 1 ♂.

Andrena apacheorum Ckll. L., 1 ♀, 1 ♂. L. P. T., 3 ♂, at *Erigeron* and *Senecio*.

Andrena topazana Ckll. L., 1 ♀, July 19, the dorsal pubescence gone and wings tattered.

Sphecodes eustictus Ckll. L., 5 ♀. T. S., 1 ♀. H., 1 ♀. T. L., 1 ♀. This species has remarkable altitudinal range; it was described from the lower part of the Transition Zone.

Sphecodes millsi n. sp.

♂. Length about 7 mm.; head and thorax black, with silvery white hair, dense on face; apical half of mandibles red; legs black, with the knees, fore tibiae except a large mark on outer side, apices of middle and hind tibiae, and all the tarsi, clear ferruginous; antennae long, moniliform, the flagellum dull testaceous beneath; second and third joints equal, and combined almost as long as fourth; mesothorax and scutellum highly polished, with sparse but distinct punctures; area of metathorax large, semilunar, covered with coarse vermiform rugae; posterior truncation very coarsely punctured; tegulae dark reddish brown; wings hyaline, stigma and nervures fusco-ferruginous; third submarginal cell very large, broad above; spurs pale ferruginous; abdomen elongate, smooth and highly polished; first segment black with apical margin broadly red; second and third red with a broad black band, suffusedly interrupted laterally; fourth black with apical margin broadly red; fifth black, as also sixth; apical plate red.

Longs Peak Inn, on an umbelliferous flower, July 21 (*Cockerell*). Named after Enos Mills. Allied to *S. clematidis* Rob., but larger, with the abdomen differently marked. From *S. sulcatulus* Ckll. it is easily known by the largely red legs.

Halictus lerouxii Lepel. T. S., 1 ♂ at *Orcocarya virgata*.

Halictus galpinsiae Ckll. T. L., 1 ♂. I was astonished to find this at such an altitude.

Halictus virgatellus Ckll. L., 1 ♂. The male is new, and is determined as this species because it has the characters to be expected in male *virgatellus*. It differs from *H. typographicus* Ckll. by the entirely dark antennae, grayish wings and much darker stigma.

Halictus pruinosiformis Crawf. L., 1 ♀.

Halictus peraltus Ckll. L., 1 ♂, July 19 (*W. P. C.*).

Halictus nigricallis Vachel. L., 1 ♂. The tubercles have a small inconspicuous pale spot posteriorly.

Halictus peralpinus n. sp.

♀. Length about 6.5 mm., anterior wing 5.4 mm.; black, including legs, but the flagellum with a light fulvous streak beneath, not reaching base or apex; hair of head and thorax scanty, sordid white; head longer than broad; mandibles reddened at apex; lower part of clypeus shining, upper part dull; supraclypeal area shining; front dull, the whole surface minutely sculptured between the punctures; mesothorax dull, with very fine punctures, and the surface lineolately sculptured between; area of metathorax very finely and delicately wrinkled; tegulae piceous; wings dusky hyaline, stigma reddish brown; hind spur pectinate with few spines; abdomen shining, not banded, hind margins of segments brownish.

Longs Peak trail, Colorado, above timber line, July 20, 1919 (*Wilmatte P. Cockerell*).

Differs: (*a*) from *divergens* Lovell by the larger, broader head, dull mesothorax, and absence of distinct white hair-patches on abdomen; (*b*) from *dasiphorae* Ckll. by the dull mesothorax, without punctures distinctly visible under a lens, and the pale streak on flagellum; (*c*) from *inconditus* Ckll. by the dull mesothorax.

Halictus supranitens n. sp.

♀. Length about 6 mm., anterior wing about 5.3 mm.; black, including legs and antennae, apical half of mandibles reddened; hair of head and thorax scanty, sordid white; head rather elongated, with prominent clypeus, which is shining, with large sparse punctures; supraclypeal area and sides and lower part of front shining, the front extremely densely and finely punctured; mesothorax and scutellum polished, with fine rather sparse punctures; area of metathorax very finely wrinkled, its posterior margin prominent, obtuse, shining; posterior truncation shining, concave in lateral view; tegulae black with a brown spot; wings hyaline, stigma and nervures reddish brown; second submarginal cell broad; legs with white hair, a red brush at end of hind basitarsus; hind spur with three large spines; abdomen shining, pruinose with dull white pubescence, but without distinct bands or hair-patches.

Longs Peak trail, Colorado, above timber line, July 20, 1919 (*Cockerell*). Differs: (*a*) from *inconditus* Ckll. by the clear wings, more shining thoracic dorsum, and shining posterior rim of metathoracic enclosure; (*b*) from *dasiphorae* Ckll. by similar characters; (*c*) from *divergens* Lovell by the dark tegulae, clear wings, etc.

Halictus glaucovirens n. sp.

♀. Like *H. pruinoziformis* Crawf., but head elongated as in *H. pruinosus* Rob., from which it differs by the darker flagellum, and more strongly and less densely punctured mesothorax, with a shining sparsely punctured area on each side of the middle. The insect is glaucous green, with pure white pubescence; wings hyaline, stigma pale yellowish, subcostal nervure black. The thorax is not so robust as in *pruinosus*.

Longs Peak trail, above timber line, July 20, 1919 (*Cockerell.*)

Halictus hudsoniellus n. sp.

♀. Length about 5 mm.; slender, with unusually pointed abdomen; head and thorax olive-green, the scutellum and mesopleura more glaucous green; labrum and apical half of mandibles red; flagellum strongly reddened except at base; pubescence pure white; legs black, with the knees, tibiae at apex and the tarsi reddened; tegulae yellowish testaceous; wings hyaline, stigma and nervures testaceous, subcostal nervure black; abdomen apricot-color, shining, the third and following segments pruinose with white hair. Head subcircular; front shining; mesothorax dullish, finely punctured; scutellum shining; area of metathorax appearing minutely granular, but under compound microscope showing irregular vermiform anastomosing raised lines; the mesothorax posteriorly is more or less (microscopically) transversely sulcatulate; hind spur with four large spines.

Longs Peak trail, Hudsonian Zone, July 22 (*Cockerell*). The altitude of the locality is probably about 10,500 feet.

Related to *H. scrophulariae* Ckll., but smaller, and easily separated by the red labrum, much redder antennae, abdomen more hairy on apical parts with the surface of fourth and fifth segments darkened under the hair. From *H. clematisellus* Ckll. it is known by the much more hairy abdomen. The head is not nearly so broad as in *H. clarissimus* Ellis.

Halictus sp. L. P. T., 1 ♂, at *Senecio* (*W. P. C.*). An undescribed male which I cannot clearly associate with any known female; it is perhaps a new species. It is a small *Chloralictus* with olive-green mesothorax, black abdomen, and pale testaceous stigma.

Halictus viridatulus n. sp.

♀. Like *H. viridatus* Lovell, with the same highly characteristic radiating plicae on area of metathorax, though these are not quite so strong. It differs from *H. viridatus* by the dusky stigma and entirely

black abdomen. The antennae are only slightly reddish beneath toward apex. Supraclypeal area and upper part of clypeus brassy; front blue-green, dullish, very densely punctured, its lower part microscopically transversely lineolate; mesothorax and scutellum dullish rather dark blue-green; pleura dark blue-green; tegulae piceous; wings dusky; stigma and nervures dilute brownish; hind spur with large spines; abdomen polished; second segment with thin white hair at sides and base: third and following segments thinly hairy all over.

Longs Peak Inn, Colorado, July 19 (*Cockerell*). Also one on July 21. A western mountain representative of *H. viridatus*. The sculpture of the metathoracic area separates it at once from the superficially similar *H. ruidosensis* Ckll. In the second specimen the upper part of clypeus and supraclypeal area are not brassy.

PANURGIDAE.

Halictoides maurus Cress. H., 1 ♂.

Halictoides harveyi Ckll. L. P. T., 1 ♂ at *Potentilla*. L., 1 ♂.

Panurginus cressoniellus calochorti Ckll. T. S., 1 ♂, 1 ♀. L., 8 ♂, 7 ♀.

Panurginus bakeri Ckll. H., 1 ♂, 1 ♀.

Panurginus porterae Ckll. L., 1 ♂ (*W. P. C.*).

NOMADIDAE.

Nomada fontis Ckll. L., 1 ♀, July 19 (*W. P. C.*). Evidently this species, but possibly a local (mountain) race, as it differs from the type by the blacker abdominal bands, larger yellow mark on sides of second segment, and pair of subdorsal yellow spots on fourth and fifth segments.

Nomada (Phor) siccorum n. sp.

♂. Length nearly 7 mm.; head, thorax and abdomen black, with creamy-white markings; pubescence very scanty, white, tinged with brown on thorax above; head broader than long; eyes gray; face with appressed silvery hair; labrum, mandibles except apically, narrowly interrupted band on lower margin of clypeus, lower corners of face with linear extension upward, and the swollen scape anteriorly, all yellowish-white; flagellum black or nearly so above, ferruginous beneath; third antennal joint much shorter than fourth; mesothorax dull, rugosopunctate, wholly black; tubercles with a light spot; mesopleura with a transverse white mark anteriorly; scutellum (which is not prominent) and metathorax wholly black; tegulae bright ferruginous; wings slightly dusky, strongly so on apical margin; stigma dull rufous, nervures fuscous; basal nervure meeting transversomedial;

first recurrent nervure joining middle of second submarginal cell; legs ferruginous, black at base, and variably black posteriorly, the hind pair strongly so; fore and middle tibiae with a white dot at base and larger spot apically; hind tibiae with a large white mark at each end, the interval between blackened; abdomen brown-black, the first four segments with interrupted cream-colored bands, that on second extremely broad, the fifth and sixth with entire bands, bands on second and third segments emarginate on each side posteriorly, the next two enclosing black spots; apical plate narrow, entire; venter reddish marked with white.

Longs Peak Inn, in a dry sandy spot, July 21 (*Cockerell*). Quite distinct from the other species of *Phor*. Among Cresson's species of *Nomada*, it suggests *N. gracilis*, but that has the apical plate of abdomen notched and the abdomen is differently marked. In my table of Rocky Mountain species it runs to *N. aquilarum*, which differs in the antennae, etc.

Nomada sedae n. sp.

♀. Length nearly 9 mm.; head, thorax and legs ferruginous, marked with black, the only yellow being a spot on each side near apex of metathorax; head broad; eyes very dark reddish; mandibles simple; disc of clypeus extremely finely punctured; lower middle of front, region of ocelli, and cheeks posteriorly, black; antennae red above and below; third joint fully as long as fourth, perhaps a little longer; mesothorax closely punctured, with a single median black band; metathorax with a broad median black band; mesopleura red, but sides of thorax black anteriorly and posteriorly; tegulae yellowish-ferruginous; wings dusky, with the usual hyaline area; stigma clear ferruginous, nervures fuscous; basal nervures going a short distance basad of transversomedial; second submarginal cell very large, receiving recurrent nervure in middle; legs red, fore and middle femora with a large black basal spot beneath, hind coxae black behind except at apex, hind femora rather extensively blackened at base and behind; abdomen red, shining, the first segment with more than basal half black, and four minute obscure yellowish spots along the margin of the black; apex of first segment, and second and third subapically, with blackish bands; second and third segments with very broad but broadly interrupted bright yellow bands; fourth with an entire band deeply emarginate posteriorly at sides; fifth with a band interrupted on each side, leaving a round lateral yellow spot; margin of fifth with a band of dense silvery white tomentum; pygidial plate very large, thinly hairy; venter red without yellow markings.

Longs Peak Inn, July 21, at flowers of *Sedum stenopetalum* (*W. P. Cockerell*). Runs in the Rocky Mountain key (Bull. 94, Colo. Agr. Exper. Station) to 65, but is quite distinct from *N. libata, coloradensis* or *mera*. On account of the structure of the antennae it falls near *N. alpha* Ckll., from which it is easily known by the markings.

MELECTIDAE.

Phileremus americanus Cress. H., 1 ♂.

ANTHOPHORIDAE.

Anthophora smithii Cress. L., 1 ♂. This differs from the New Mexico race (*cardui* Ckll.) by having the clypeus, etc., clear white (cream-color in *cardui*), and the eyes purplish-gray (pale green in *cardui*).

Clisodon terminalis Cress. L., 2 ♀. T. S., 1 ♀. L. P. T., 1 ♀.

Melissodes kelloggi n. sp.

♂. Length about 9 mm. Runs in my table of *Melissodes* (Trans. Am. Ent. Soc., xxxii, p. 76) to *M. rivalis* Cress., but is smaller and otherwise different. The general aspect is that of *M. agilis* Cress., but it is readily distinguished by the dark purplish or blue-green (not pale green or pea-green) eyes, the entirely black labrum and base of mandibles, the darker antennae (flagellum black above) and the dark fuscous nervures. Compared with *subagilis* Ckll., it is at once distinguished by the color of eyes and antennae. The thorax has very pale ochreous tinted hair, with no dark hairs on the dorsum.

Longs Peak Inn, July 19 and 21 (*T. D. A. and W. P. Cockerell*). 5 ♂. Dedicated to Professor Vernon Kellogg, in recent years distinguished for his great services to humanity, but long ago a keen collector and student of the insects of the Long's Peak region.

MEGACHILIDAE.

Coelioxys ribis Ckll. L., 1 ♀ (*W. P. C.*).

Coelioxys moesta Cress. L. P. T., at *Senecio*, 1 ♀ (*W. P. C.*).

Megachile montivaga Cress. L. P. T., at *Phacelia*, 1 ♂ (*W. P. C.*). L., 3 ♂.

Megachile pugnata Say. H., 1 ♂. L., 1 ♀, 1 ♂.

Megachile wootoni Ckll. T. L., 2 ♂ above timber line, one ♀ at *Pentstemon stenosepalus*, at timber line (*W. P. C.*). T. S., fls. *Campanula*, 1 ♂.

Megachile vidua Smith. L., 1 ♂.

Monumetha albifrons Kirby. L., 2 ♀, 1 ♂ (one ♀ at *Astragalus*). T. S., 1 ♀, 2 ♂.

Osmia armaticeps Cress. L., 2, one at *Gaillardia*. L. P. T., 2 (one at *Arnica*). All the numerous specimens of *Osmia* taken, representing eight species, were females.

Osmia fulgida Cress. T. S., 1 (*W. P. C.*).

Osmia megacephala Cress. T. S., 1 at *Cirsium*. L. P. T., one at *Thermopsis* (*W. P. C.*).

Osmia pentstemonis Ckll. H., 1. T. L., 2 at *Pentstemon stenosepalus* (*W. P. C.*). L., 2 (one at *Astragalus*).

Osmia longula Cress. L., 2 at *Astragalus*.

Osmia wardiana Ckll. L., 1.

Osmia densa Cress. L., 3 at *Astragalus*. T. S., 2 at *Cirsium*.

Osmia albolateralis Ckll. L., 6 (5 at *Astragalus*).

Anthidium tenuiflorae Ckll. L., 2 ♀, 1 ♂.

BOMBIDAE.

All the specimens taken were workers.

Bombus mixtus Cress. B., 1.

Bombus edwardsii bifarius Cress. T. L., 2 (one at *Elephantella*, *W. P. C.*).

Bombus flavifrons Cress. H., 2.

Total 57 species; 9 new. The types of the latter are in the writer's collection.

Variation in Color Pattern of the Dragonfly Gomphus crassus (Odonata).

By E. B. WILLIAMSON, Bluffton, Indiana.

"Walsh's remark (Proc. Ent. Soc. Phila. II, p. 239, 1863) that the Illinois species of Gomphus seem to have the appendages of the males 'nearly as uniform as a set of castings from the same foundry and the same mould' seems to hold true for these three species, (*fraternus*, *externus*, *crassus*) but his statement as to the specific value of minute differences of coloration and its constancy must evidently be modified in view of the variations above detailed."—Calvert, Ent. News, XII, pp. 72 and 73, March, 1901.

In ENTOMOLOGICAL NEWS, May, 1906, p. 148, I mentioned specimens of *Gomphus* which were intermediate between *crassus* and *fraternus*. At that time I still thought of *fraternus* as a species with the dorsum of abdominal segment 9 black and of *crassus* as a species with the dorsum of the same segment with a yellow spot or bar. Moreover, at that time I did

not have my present ability in discriminating likenesses and differences in abdominal appendages. The material, upon which the notes of 1906 were made, is now widely scattered in collections and a re-examination of it is impossible. But for several years past I have had it in mind to repeat the observation again at the earliest opportunity, as I felt some doubts as to the accuracy of my earlier conclusions.

A chance to make this study came this year, when on June 8, 1919, I found *G. crassus* again abundant at a ripple in the Wabash where the river flows along the city corporation line of Bluffton, Indiana. Only two gomphines were on the wing at the ripple and these were *G. crassus* and *fraternus*. Of the former seventy-six males and eleven females, and of the latter about twenty males were taken. These specimens, it may be repeated, were all taken at one short ripple on the same day.

A constant color character not hitherto employed for separating the males of the two species was detected. In *fraternus* the sterna of abdominal segments 8 and 9 are largely yellowish. In *crassus* the same sterna are largely brown, patterned in lighter and darker brown, with the only pale area a greenish or yellowish bar, or two spots, anterior to the parameres. The seventy-six males of *crassus* were so colored and the appendages of all were identical.

But in the color pattern of the dorsum of the apical abdominal segments the seventy-six males of *crassus* showed a wide variation. The following tabulation by groups will give a fairly accurate statement of the facts:

Group I. A minute basal dorsal yellow spot on 8, dorsum of 9 and 10 black ..... 2 males
Group II. Like I, but spot on 8 slightly larger..... 12 males
Group III. Like II, but spot on 8 slightly larger and segment 9 with a dorsal basal yellow point ..... 10 males
Group IV. Segment 8 about as in III or spot slightly larger, spot on 9 slightly larger ..... 18 males
Group V. Spot on 8 larger than in IV, on segment 9 about one-fourth to one-third the length of the segment ..... 13 males
Group VI. Similar to V, but spot on segment 9 one-half or slightly more than half the length of the segment..... 10 males
Group VII. Similar to VI, but spot on segment 9 wider and reaching or almost reaching the apex of the segment... 6 males

Group VIII. Similar to VI, but the spot on segment 9 wider and reaching the apex, but not as wide as the black on either side of it ..... 4 males

Group IX. Yellow on segment 9 as wide as the black on either side of it, segment 10 with a rounded dorsal yellow spot ..... 1 male

Referring to the dorsum of segment 10, mentioned in group IX, its color in the other groups may be briefly tabulated: black in two of I, eleven of II, eight of III, twelve of IV, five of V, three of VI, and one of VII; with a narrow crest or spot of yellow (often almost microscopic) on the middorsum of segment 10, one of II, two of III, six of IV, eight of V, seven of VI, five of VII, and four of VIII.

The eleven females of *crassus* may be grouped as follows:

Group I. Dorsum of segments 9 and 10 black.....7 females

Group II. Dorsum of 9 and 10 each with a small yellow spot, subbasal on 9, submedian on 10 .....3 females

Group III. Spot on 9 prolonged as a median line to apex of segment, spot on 10 larger than in groups I and II...1 female

In view of this material I believe my reference in 1906, referred to above, to intermediates between *crassus* and *fraternus*, should be disregarded, and I know of no evidence pointing to the interbreeding of these two species.

Several cases of the capture in couple of sexes of different species have been recorded. The most unique I have encountered was met when I took a male *Argia tibialis* flying with a female *Lestes uncatus* along the Aboite River, seven miles southwest of Ft. Wayne, Indiana, July 6, 1919. During the time they were observed before capture several unsuccessful attempts at copulation were made.

At this date *Argia tibialis* was abundant along the Aboite River, which is only a creek eight to fifteen feet wide, while *Lestes uncatus* was at home in numbers at nearby small woodland swamps from one of which the female along the creek had doubtless wandered.

Annual Meetings of Entomologists.

The annual meeting of The Entomological Society of America will be held on Monday and Tuesday, December 29 and 30, 1919, and that of The American Association of Economic Entomologists on Wednesday, December 31, 1919, and Thursday and Friday, January 1 and 2, 1920, both at St. Louis, Missouri.

Hesperia syrichtus and montivagus (Lep.).

By Henry Skinner.

Dr. J. L. Reverdin has published an interesting article * on *Hesperia syrichtus* Fab. He gives the synonymy of the species and has made an extensive study of the genitalia from numerous specimens. As this is a North American species, it is of interest to our students of the butterflies. He describes and figures the typical form and also two new varieties, *fumosa* and *syrichtides*. *Fumosa* is the common form at Key West, Florida. The whole underside of the secondaries is light brown.

It has been a matter of considerable interest to know what the *Pyrgus montivagus* of Reakirt is. I have previously pointed out† that *montivagus* Reak. is a synonym of *syrichtus* Fab. The evidence that this is so is very good, but it is hardly possible to know these things absolutely. *Montivagus* has been treated in different ways by a number of authors. The original description says: "Hab.—Rocky Mountains, Colorado Territory. (Coll. Tryon Reakirt)." "Mexico, near Vera Cruz." "Wm. H. Edwards." "Most probably an Alpine modification of the common *Pyrgus oileus*." *Pyrgus oileus* West.-Humph. pl. 38, fig. 14-15, is said by the authors to be a North American insect and the figures probably represent *syrichtus* Fab., where it is placed by Kirby in his catalogue. The Tryon Reakirt collection was purchased by Herman Strecker and it is now in the Field Museum, Chicago, Illinois.

Strecker cites‡ as the types of *montivagus*, "One ♂, one ♀, Rocky Mts., Colorado, Coll. Reakirt."

Mr. W. J. Gerhard, of the Field Museum, has supplied me with information in regard to these types.

"There are in his collection (Strecker) two specimens, a male and a female, with a red-bordered pin label on each and with the inscription, '*Pyrgus montivagus*, Colorado, Reak. Orig. type, Coll. Reakirt.' The male, which is spread to show the under side, is of average size, and, with one exception, agrees exactly with the specimen you sent as *syrichtus*. The exception is that the color of the secondaries below

*Bulletin of the Lepidopterological Society of Geneva, Vol. IV, p. 96, 1919.

†Ent. News, 17, 277, 1906.

‡Strecker, Rhop. and Het., Suppl. 3.

is of a light brownish tinge; so much so is this the case that the transverse macular bands are very indistinct. The secondaries of the female, which is smaller than the male, and is also pinned to show the under surface, are likewise suffused with a light brown tinge."

Mr. Gerhard says the male has the tuft of hairs near the base of the hind tibiae. Unless it can be shown that the description of *montivagus* represents something different from these types, *montivagus* Reak. becomes a synonym of *syrichtus* Fab.

A new Tachytes from Georgia (Hymenop.: Larridae).

By J. Chester Bradley, Cornell University, Ithaca, New York.

Tachytes auricomans n. sp.

♂. Color, pile and wing color as in *crassus*, the golden pubescence very pronounced. Length 16 mm.

Agrees in structure and sculpture with *crassus*, except in the following points: segments 4 and following of the antennae are less rounded out beneath than are those of *crassus;* the vertex less narrowed; (in *crassus* the least distance between the eyes is scarcely if any more than the length of the 3rd antennal segment, in *auricomans* it is considerably more); clypeus with the external lateral tooth acute and prominent, the anterior border between these teeth evenly and but slightly rounded (in *crassus* these teeth are blunt and not so prominent, and the middle part of the margin between them is produced into a small rounded lobe).

Habitat.—Georgia: Oglethorpe, 1 July, 1910, 3 ♂ (the author).

Type.—Holotype, Cornell University, No. 147.1, paratype, No. 147.2; paratype in collection of Georgia State Board of Entomology.

Sugaring for Moths (Lepid.).

It is possible that moths, like some people, will not greatly fancy the new near-beer, in place of their old tipple of stale beer and brown sugar. So here is a new recipe and a suggestion.

While camping this summer, my wife tried to make some wild goose-berry jelly. Being a long ways from a source of supply, she used too little sugar, and the result was a sticky syrup that did not "jell." Part of it fermented, standing in a glass jar where the sun hit it. I poured the fermented goose-berry syrup down an alder, and that evening found four Catocalae, besides several small Noctuids, on the one tree-trunk. Unfortunately, I did not have enough sugar to experiment further, but it is very likely that the fermented juice of any local fruit or berry, with a little sugar added, possesses the proper "kick" to attract moths. I had tried the regulation mixture of beer and sugar, in other years, in the same locality, and never had a single Noctuid come to the bait.—W. H. Ireland, Maricopa, California.

ENTOMOLOGICAL NEWS.

PHILADELPHIA, PA., DECEMBER, 1919.

After Thirty Years.

When this number of the NEWS reaches the reader, there will stand on the editor's shelves thirty completed volumes of this journal, unbound, except for their original pink paper covers, which, when they first appeared, led one subscriber, and contributor to the first number, to protest that the color suggested too much a patent medicine advertisement. For a few issues that subscriber's copy was bound in white paper, but the pink cover was retained for the magazine as enabling it to be picked out readily from others in a pile.

The Treasurer of the Society which has stood back of the NEWS from the start is fond of telling the story that when it first appeared it was freely predicted that it would not last six months, but time has proven the contrary.

There lies before the editor a single sheet, printed on both sides, headed, "A New Entomological Journal. To be published Under the auspices of the Entomological Section of the Academy of Natural Sciences of Philadelphia, and the American Entomological Society." It is dated "Philadelphia, Pa., Dec. 1, 1889" and continues:

> It has for some time been apparent to Entomologists in this country that there was unoccupied room for a journal of Entomology devoted less to the dry details of descriptive and classificatory work and more to the news and gossip which is always of interest to entomological workers.

The circular continues in the words of the Announcement, occupying the first two pages of Volume I, Number 1, which actually appeared January 14, 1890.

The pressure of other work and the non-receipt of desired information have made it impossible to fulfil always the purposes for which the NEWS was founded, and we still welcome, to quote the Announcement again:

> Scientific papers, news notes, reports of societies, etc., . . . from all sources to make this journal just what its name implies, a compend of entomological news.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

A Loved and Respected Entomologist.

I had gone up to the Pocono Mountains by the way of the Wind Gap and as the roads were worse than a flown butterfly without any scales, I decided to return to Philadelphia by the way of the Delaware Water Gap. In the Gap, in front of the Kittatinny House, I saw coming down the side of the mountain an individual with a net. Having experienced the usual salutation and having read of it in the words of the individual, I said, "Goin' fishin'?" It was a mean joke and I felt ashamed of it, but the question popped out like a pea from a pod. The answer came, "No, I don't fish, I am an entomologist." I then asked, "What is an entomologist?" "An entomologist is one who studies and collects insects." My reply was to the effect that collecting insects was a foolish and silly thing to do and not worth while. The entomologist said, "What is worth while?" I felt that I was being looked upon with pity and perhaps scorn, on account of my not being an entomologist, but when I admitted I did not know what was the use of anything, I was finding a little favor and was getting near the wisdom of Socrates when he said, "I know that I know nothing, others know not even this." Then the entomologist said, "Do you know how old I am?" and I guessed 79, but the answer came back, "No, 81." I had forgotten that I had not seen the entomologist for several years and that "tempus fugits." I then spoke of the White Mountains of New Hampshire, where I had just spent my vacation and where the entomologist had collected many summers, I think 28, and that I always told the lovers of nature that I met up there to read "Fishin' Jimmy" and the other stories in the "Seven Dreamers" and that they were full of local color and breathed the spirit of the mountains. Then we walked toward our auto and I told my wife that I had loved and respected this entomologist for many, many years and she was not a bit jealous as she felt exactly the same as I did. This entomologist was very good to me in the years gone by and there is many a specimen in my collection taken at Franconia in the White Mountains and Biscayne Bay in Florida. The entomologist has spent fourteen summers at the Delaware Water Gap and is still more active than many a person forty years younger. I was not recognized, but finally admitted that I was fond of entomology and that I had more than a million insects under my care and that I really did not think that everyone I saw with a net was "goin' fishin'."

Preservatives for Plants and Insects.

October 20, 1917, the writer preserved Hessian fly infested wheat and army worm (*Cirphis unipuncta*) larvae in the following solutions, hot and cold.

1. Salicylic acid 1-16 ounce, alcohol (95 per cent.) ½ ounce, water 16 ounces.
2. Sulfurous acid ¼ ounce, water 16 ounces.
3. Formalin 7½ per cent.
4. Zinc chloride ½ ounce, water 24 ounces.
5. Corrosive sublimate ⅛ ounce, glycerine 3¼ ounces, water 32 ounces.

A recent (March 7, 1919) examination gives the following results: The wheat plants were well preserved in salicylic acid and formalin solutions, but the color badly faded and there was apparently no difference in the hot and cold solutions. The corrosive sublimate-glycerine mixture preserved the plants fairly well when used hot, but those preserved in cold solution were blackened and rotten. The sulfurous acid and zinc chloride solutions gave the best results, preserving the color of the foliage very well. In the case of the sulfurous acid those preserved cold were apparently better. In the case of zinc chloride it was impossible to determine the relative merits of the hot and cold mixtures as the plants preserved cold were partly out of the solution, causing them to fade somewhat.

The army worms preserved in sulfurous acid and corrosive sublimate-glycerine solutions were in very poor condition. Salicylic acid-alcohol preserved the larvae nicely and, although color is faded, the markings are distinct. The cold solution apparently did not preserve the form quite as perfectly, but the colors are better preserved. Formalin preserved the shape, color and markings in fair condition, the ones preserved hot being the better. Zinc chloride gave the best results and the colors are well preserved, those preserved hot seemingly the better.

The need of preservatives which will preserve colors to a fair degree and at the same time preserve the shape of plants and insects is evident, and these notes are given in hopes other workers will have an opportunity to test these and other solutions in comparison. From the few tests we have made the sulfurous acid and zinc chloride solutions prove to be fairly good plant preservatives, while zinc chloride gives good indications as a preservative for larvae.—JOHN J. DAVIS, Riverton, New Jersey.

Entomological Literature.

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted: but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded.

The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of papers containing new genera or species occurring north of Mexico are all grouped at the end of each Order of which they treat.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

2—Transactions of The American Entomological Society, Philadelphia. **4**—Canadian Entomologist, London, Canada. **7**—Annals of The Entomological Society of America, Columbus, Ohio. **8**—The Entomologist's Monthly Magazine, London. **10**—Proceedings of the Entomological Society of Washington, D. C. **11**—Annals and Magazine of Natural History, London. **17**—Lepidoptera, Boston, Mass. **22**—Bulletin of Entomological Research, London. **29**—Annual Report of the Entomological Society of Ontario, Toronto.

41—Bulletin de la Societe Entomologique Suisse, Bern. 53—Nature Study Review, Ithaca, N. Y. 62—Bulletin of the American Museum of Natural History, New York. 70—Journal of Morphology, Philadelphia. 76—Nature, London. 100—Biological Bulletin of the Marine Biological Laboratory, Woods Hole, Mass.

GENERAL. **Andrews, H. V.**—A suggestion [regarding printed lists for collections]. **17,** iii, 65-6. **Brues, C. T.**—Classification of insects on the characters of the larva and pupa. (Biol. Bul., Woods Hole, Mass. xxxvii, 1-21.) **Criddle, N.**—Some insect problems in the prairie provinces. **29,** xlix, 32-5. **Davis, J. J.**—Present day problems in entomology. **29,** xlix, 47-59. **Johnson, H. L.**—A cheap substitute for the riker mounts. **17,** iii, 66-7. **Lochhead, W.**—Some chapters of the early history of entomology. **29,** xlix, 69-81. **Morris F. J. A.**—The life history of a hobby horse. **29,** xlix, 39-46. **Muttkowski, R. A.**—The fauna of Lake Mendota [Wisconsin] (Trans. Wisconsin Acad. Sci. Arts & Let., xix, 374-482). **Nielsen, J. C.**—Undersogelser over entoparasitiske Muscidelarver hos Arthropoder. VII. (Vidensk. Medd. fra Dansk Naturh. Foren. Kobenhaven, lxx, 1-57.) **Van Hyning, T.**—Insect larvae destroying Physa [Molluscal. (The Nautilus, xxxiii, 71-2). **Wolley Dod, F. H.**—Obituary. **4,** 1919, 239-40.

GENETICS, ETC. **Goldsmith, W. M.**—Comparative study of the chromosomes of the tiger-beetles. **70,** xxxii, 437-87. **Nakahara, W.**—Study of the chromosomes in the spermatogenesis of the stonefly, Perla immarginata. **70,** xxxii, 509-29. **Onslow, H.**—The inheritance of wing colour in L. (Journ. of Genetics, viii, 209-238.) **Richards, M. H.**—Two new eye colors in the third chromosome of Drosophila melanogaster. **100,** xxxv, 199-206. **Seiler, I.**—Researches on the sex-Chromosomes of Psychidae (Lep.) **100,** xxxvi, 399-404.

MEDICAL. **Goeldi, E. A.**—Darmkanal und russel der stubenfliege vom sanitarischen standpunkte aus. **41,** xii, 418-31. **Hill, G. F.**—Relationship of insects to parasitic diseases in stock (Proc. Roy. Soc. Victoria, xxxi, 11-107). **Metz, C. W.**—Anopheles cruciians, as an agent in malarial transmission. (U. S. Pub. Health Rept., Reprint No. 536.) Observations on the food of Anopheles larvae. (U. S. Pub. Heal. Rept., Rep. No. 549.)

ARACHNIDA & MYRIAPODA. **Emerton, J. H.**—Notes on the spiders collected by F. Johansen in Northeastern Greenland (Vidensk. Medd. fra Dansk Naturh. Foren. Kobenhaven, lxx, 143-5). **Nebel, C. E.**—The amount of food eaten by the spider Aranea sericata. (Trans. Wisconsin Sci. Arts & Let., xix, 524-30.)

Chamberlin, R. V.—New western spiders. **7,** xii, 239-60.

NEUROPTERA. **Bagnall, R. S.**—Brief descriptions of new Thysanoptera. **11,** iv, 253-77. **Dean, F. R.**—A flight of the mayfly at Fenton, Mo. **17,** iii, 74. **Selys-Longchamps, E.**—Collections zoologiques. Catalogue, Fasc. iii, pt. 1-2, Copeognatha, Isoptera; xvi, pt. 2, Libellulinen. **Thompson, C. B.**—The development of the castes of nine genera and thirteen species of Termites. **100,** xxxvi, 379-98.

ORTHOPTERA. **Bodkin & Cleare.**—An invasion of British Guiana by locusts in 1917, with a complete illustrated account of the life history of the species. **22,** ix, 341-57. **Hebard, M.**—A new Central Am. genus & sp. of the group Blattellites (Blattidae). **2,** xlv, 303-6.

Hebard, M.—New gen. & sps. of Melanopli found within the U. S. (Acrididae). A new gen. & sps. of roach from the U. S. and tropical N. A. (Blattidae). **2,** xlv, 257-98; 299-302. **Rehn, J. A. G.**—Descriptions of new and critical notes upon previously known forms of N. A. Oedipodinae (Acrididae). **2,** xlv, 229-55.

HEMIPTERA. **Baker, A. C.**—Aphids: their human interest. **29,** xlix, 28-32. **Kornhauser, S. I.**—Sexual characteristics of the membracid, Thelia bimaculata. **70,** xxxii, 531-635. **Matheson, R.**—A study of the plant lice injuring the foliage and fruit of the apple. (Mem. 24, Cornell Univ. Agr. Exp. Sta., 679-762.) **Smith, L. B.**—The life history and biology of the pink and green aphid. (Virginia Truck Exp. Sta. Bul., No. 27.) **Wilson & Vickery.**—A species list of the Aphididae of the world and their recorded food plants. (Trans. Wisconsin Acad. Sci. Arts & Let., xix, 22-355.)

Fracker, S. B.—Chariesterus and its neotropical relatives (Coreidae.) **7,** xii, 227-30. **Davis, J. J.**—Miscellaneous aphid notes. **4,** 1919, 228-34. **Herbert, F. B.**—A new sp. of Matsucoccus from the pines in California. **10,** xxi, 157-61. **McAtee, W. L.**—Report on a second collection of Nova Scotian Eupterygid leaf-hoppers, including descriptions of new varieties. **4,** 1919, 225-6. **Sanders & De Long**—Eight new "Jassids" from the eastern U. S. **7,** xii, 231-38.

LEPIDOPTERA. **Comstock, A. B.**—The American silk-worms. **53,** xv, 263-77. **Drz, A.**—Organes pulsatiles des L. (Revue Scien., lvii, 532). **Dixey, F. A.**—Opening address, Section of Zoology, British Association at Bournemouth. [Mimicry]. **76,** civ, 121-26. **Proud, A. E.**—My study of moths from living specimens. **53,** xv, 286-91. **Reiff, W.**—Notes and additions to Barnes' and McDunnough's illustrations of the genu Catocala. Catocala herodias. **17,** iii, 69-70; 73-4. **Rowley, R. R.**—Descriptions of four Catocala larvae. **4,** 1919, 226-7. **Ruckers, H.**—Notes on the male genital system in certain L. **7,** xii, 192-213. **Welch, P. S.**—The aquatic adaptations of Pyrausta penitalis. **7,** xii, 213-26.

DIPTERA. **Davidson, W. M.**—Notes on Allograpta fracta. **4,** 1919, 235-9. **Hamm, A. H.**—Observations on the horse bot-fly, Gastrophilus equi. **8,** 1919, 229-30. **Johnson C. W.**—A revised list of the D. of Jamaica. **62,** xli, 421-49. **Plath, O. E.**—A muscid larva of the San Francisco bay region which sucks the blood of nesting birds. (Univ. Calif. Pub., xix, 191-200). **Tothill & McLaine**—The recovery in Canada of the brown-tail moth parasite (Compsilura concinnata). **29,** xlix, 35-9.

COLEOPTERA. **Beaulieu, G.**—Monographie des Melasides du Canada. (Le Naturl. Canadian, xlvi, 73-83, cont.)

Wickham, H. F.—Scaphinotus (Pseudonomaretus) mannii n. sp. (Carabidae). **10,** xxi, 170-3.

HYMENOPTERA. **Hutson, J. C.**—The N. A. species of the genus Sceliphron. **2,** xlv, 203-227. **Larue, P.**—Vue des couleurs par une abeille. (Revue Scien., Paris, ivii, 565.)

Gahan, A. B.—Descriptions of seven new sps. of Opius. (Braconidae). **10,** xxi, 161-70.

Études de Lepidoptérologie Comparée. By Charles Oberthür. Fascicule XVI. This volume contains a long article on the lepidoptera of Barbary. The second article is by Gédéon Foulquier on *Carcharodus bacticus* in "Bouches-du-Rhone." Observations relative to the life-history of *Lycaena alcon*. The stages of *Lycaena alcon* by Dr. T. A. Chapman. *Orrhodia rubigo* Ramb. by Philippe Henriot. Observations on *Carcharodus altheae*, by Harold Powell. André Avinoff describes a wonderful melanic aberration of *Papilio podalirius* which he calls *lucifer*. The volume ends with a document on the conservation of *Parnassius apollo*. There are twenty-six plates of the same excellent character as in the previous volumes.—H. S.

Feldman Collecting Social.

Meeting of June 8th, 1919, at the residence of H. W. Wenzel, 5614 Stewart St., Philadelphia. Nine members present, Pres. H. W. Wenzel in the chair.

Diptera.—Mr. Hornig stated that formerly there were millions of *Aëdes sollicitans* Wlk. at Weccacoe Avenue in Philadelphia Neck, but since the government has filled in this neighborhood they have entirely disappeared.

Coleoptera.—Mr. H. W. Wenzel said he had gone to Anglesea, New Jersey, on May 30th, and at that time there were strong westerly winds, but during the night they shifted to the east, and he went to the beach early in the morning, where he found the grasses, etc. (blown to sea the night before) cast at high tide mark by the easterly winds. Under this debris he found eight species and a variety of *Sphenophorus* as follows: *aequalis* Gyll., *pertinax* Oliv. (and a variety with red tint above and red band below), *setiger* Chitt., *villosiventris* Chitt., *costipennis* Horn, *venatus* Say, *scae* Walsh and *melanocephalus* Fabr.

Lepidoptera.—Mr. Hornig exhibited a specimen of *Chrysophanus thoe* Boisd. which he collected in Philadelphia Neck, June 12, 1919, Mr. Laurent stating it was the fourth he had seen from this locality in all his collecting experience.

At the meeting of September 17th, 1919, nine members present, Pres. H. W. Wenzel in the chair, being the first meeting since the summer collecting season, general discussion was the order of the evening.

Geo. M. Greene, *Sec'y.*

Correction.

Page 247 of the News for November, 1919, strike out the tenth line from the bottom: "hand side of the specimen has the wings normal male, and the right"

INDEX TO VOLUME XXX.

(* indicates *new* genera, species or varieties.)

ALEXANDER, C. P. Two new crane-flies from California.214
Notes on the genus *Dicranoptycha*..... 19
ALDRICH, J. M. *Leiomyza* in North America (ill.).....137
BAKER, A. C. A *Melaphis* from moss (ill.).....194
BARNES & LINDSEY. A new Geometrid from Arizona 245
BECKER, G. G. A one-year life cycle for *Saperda candida*, reared in an apple..... 24
BRADLEY, J. C. A new *Tachytes* from Georgia.....208
BRAUN, A. F. Descriptions of new species of *Coleophora* 108, 127
Notes on Cosmopterygidae, with descriptions of new genera and species.....260
BRYANT, G. E. Richness of Borneo in Coleoptera.....252
CALVERT, P. P. After thirty years (editorial).....290
An appeal from Belgium..... 84
Botanical abstracts (Notice)..... 25
Entomologia resurgens Belgica (editorial).....144
Entomology at the Convocation Week meetings (editorial) 49, 72
Frederic DuCane Godman (ill.).....121
International relations of entomological societies after the war (editorial).....204
A league of nations means the metric system (editorial).175
The News for 1919 (editorial)..... 23
Obituary: Victor Arthur Erich Daecke..... 58
Odonata from Guatemala collected by Wm. Schaus and J. T. Barnes (ill.).....31, 72, 160
Review: An Investigation on the Louse problem 270
Reviews: Report of the Imperial Entomologist of India 1917-1918. Studies of the Fruit-flies of Japan.....237

Review: Seventeenth Report of the State Entomologist of Minnesota 270
The use of the term larva (editorial) 265
Cockerell, T. D. A. The bees of the Rocky Mountain National Park 286
Bittacomorpha clavipes 23
Capture of ants by gummy exudations 115
Cordulegaster dorsalis as an enemy of trout 22
Crabro montanus 114
Neocorynura, a genus of Halictine bees 41
A new genus of bees from Peru 17
Cole, F. R. A new genus of the dipterous family Cyrtidae from South America 271
Coleman, L. V. An aberration of *Polygonia progne* (ill.) 112
Crampton, G. C. Notes on the phylogeny of the Orthoptera (ill.) 42, 64
Cresson & Rehn. Entomological literature, 29, 50, 85, 115, 145, 176, 206, 232, 266, 301
Cresson, E. T. Jr. Review: Wasp studies afield 54
Davis, J. J. An entomologist's handbook 32
Preservatives for plants and insects 301
(See also Wilson & Davis).
Emerton, J. H. The flights of spiders in the autumn of 1918 165
Fall, H. C. A change of names 26
Felt, E. P. Five non-gall-making midges 219
Ferris, G. F. A new species of *Pseudodiaspis* (ill.) 275
A remarkable case of longevity in insects 27
Two species of *Phylloxera* from California (ill.) 103
Frison, T. H. The occurrence of *Eurema mexicana*, in Illinois 228
Funkhouser, W. D. A new *Tylocentrus* from Arizona (ill.) 217
Gage, J. H. The staining of Coccids 142
Goe, M. T. Life history and habits of *Silpha inaequalis* ..253
Hebard, M. Remarks on the species assigned to *Cavotettix*, a synonym of *Neotettix* 78

Holland, W. J. Herbert Huntington Smith (ill.).....211
Hollinger & Parks. *Euclemensia bassettella*, the kermes parasite (ill.) 91
Hooker, H. D. Notes on the life history of *Epipsilia monochromatea* (ill.) 61
Howard, L. O. A collector's manual in Spanish..... 53
Note on the vinegarone..... 26
On the hymenopterous parasites of Kermes.....255
Howe, R. H., Jr. The Odonata of Concord, Massachusetts 10
Ireland, W. H. Sugaring for moths.....298
Kennedy, C. H. The Naiad of the Odonate genus *Coryphaeschna* (ill.) 105
Klages, E. A. Obituary: Eliza Klages.....180
Lankester, C. H. Costa Rican butterflies 216
Lindsey, A. W. A new skipper from South America (ill.).169
(See also Barnes & Lindsey).
McAtee, W. L. Notes on two Miridae, *Camptobrochis* and *Paracalocoris* 246
Preliminary key to the nearctic species of *Eupteryx*....182
Malloch, J. R. The larval habitat of *Chalcomyia aerea*.. 25
On an undescribed species of *Medeterus*..... 7
Marchand, W. Collecting the larvae of *Tabanus* and *Chrysops* 131
Martin, J. O. Notes on the occurrence of *Schizax senax* in California 231
Mengel, L. W. A new *Perisama* from South America (ill.) 181
Metcalf, C. L. *Eumerus strigatus* again.....170
Mickel, C. E. A new genus of Cerambycidae from Wyoming (ill.) 198
Mitchell, J. D. Notes on *Diacrisia virginica*.....191
Morrison, H. Appended note to Howard's Hymenopterous parasites of Kermes 258
Nicolay, A. S. Additions to insects of New Jersey No.7.276
(See also Weiss & Nicolay.)
Parker, R. R. North American Sarcophagidae; new species of the genus *Sarcofahrtia* (ill.) 201

Parks, H. B. (See Hollinger & Parks.)
Parshley, H. M. On the preparation of Hemiptera for the cabinet 223
Rehn, J. A. G. (See Cresson & Rehn.)
Reinhard, H. J. Preliminary notes on Texas Tachinidae.279
Schaus, W. A new *Amastus* from Argentina.....174
Schwarz, E. The early stages of *Catocala minuta* and a description of a new variety of *C. obscura*.....196
On the early stages of *Catocala titania*, and a description of three new varieties of *Catocala*..... 14
Scott, F. B. Abundance of Cicadas in Beluchistan.....230
Severin, G. The cause of the delay of publication of the Selys Catalogue.....229
Skinner, H. A few hours on Mt. Washington..... 48
Hesperia syrichtus and *montivagus*.....297
An interesting gynandromorphic butterfly.....247
A loved and respected entomologist.....300
A new species of *Argynnis* from Utah.....216
A new species of *Copaeodes*.....100
The next International Entomological Congress (editorial) 83
Note to Winn's *Argynnis apacheana* paper.....159
The resting place of collections (editorial).....228
Review: Class Book of Economic Entomology.....209
Review: Études de Lepidoptérologie Comparée Fasc. XVI. 304
Review: Injurious insects and useful birds..... 54
Swat the fly versus starve the brute (editorial).....114
Stop thief (editorial).....175
Stoner, D. Swarming of the monarch butterfly in Iowa. 38
Stone & Calvert. Obituary: Benjamin Hays Smith.... 88
Tillyard, R. J. A further note on the wing-coupling apparatus in the family Micropterygidae 168
Review: The wings of insects.....148
Van Duzee, M. C. Two new *Asyndetus* with a table of the North American species.....248
Van Dyke, E. C. A few observations on the tendency of insects to collect on ridges and mountain snowfields..241

New species of Buprestidae from the western United States, with supplementary notes concerning others (ill.) 151, 186
Weiss, H. B. A resurrected paper on mosquitos and malaria 101
Tinea cloacella bred from fungi.....251
Weiss & Nicolay. *Eumerus strigatus*, the lunate onion fly, in New Jersey 27
Notes on *Zeugophora scutellaris*, a European poplar leaf-miner, in New Jersey (ill.).....124
Wellhouse, W. H. An Itonid feeding on rust spores....144
Williamson, E. B. Variation in color pattern of the dragonfly *Gomphus crassus* 294
Wilson, H. F. Three new Lachnids with comparative notes on three others (ill.)..... 1
Wilson & Davis. A new genus and species of aphid (ill.) 39
Winn, A. F. *Argynnis apacheana*, and Edward's plates of *A. nokomis* 156

GENERAL SUBJECTS.

Academy of Natural Sciences of Philadelphia. (See Entomological Section.)
After thirty years 299
American Entomological Society 56, 150, 239
Appeal from Belgium 84
Belgium, An appeal from.... 84
Botanical abstracts 25
Canadian Entomologist, The jubilee of 83
Collections, The resting places of 228
Convocation week meetings, Entomology at 49
Entomologia resurgens Belgica 144
Entomological literature, 29, 50, 85, 115, 145, 176 206, 232, 266, 301.
Entomological Section, Acad. Nat. Sci., Phila..56, 118, 179, 240
Entomological societies after the war 204
Entomologist, Loved and respected 300
Entomologists, Annual meetings of 296
Feldman Collecting Social, 58, 88, 119, 150, 179, 238, 304
Handbook, An entomologist's 82
Insect parasites of insects, 91, 255, 278, 279
International Entomological Congress, The next 83
International relations of Entomological Societies after the war 204
Jubilee of the Canadian Entomologist 83
Larva, Use of the term..... 265
Memorials to the late F. D. Godman 231
Metric system, A League of Nations means the 175

New Jersey, Additions to insects of, No. 7 276
News for 1919 (Editorial)... 23
Ohio entomological workers. 120
Plants attacked by insects, 1, 94, 103, 109, 124, 127, 144, 191 216, 251, 255, 260, 277, 279.
Plants visited by insects, 48, 61, 153, 188, 279, 286
Preservative for insects..... 300
Resting places of collections.. 228
Ridges, Tendency of insects to collect on 241
Selys Catalogue, Cause of delay of publication of 229
Snowfields, Tendency of insects to collect on ridges and mountain 241
Thief, Stop 175
Thirty Years, After 299

OBITUARY NOTICES.

Blanchard, R. 210
Daecke, V. A. E. 58
Godman, F. D. (ill.) 121
d'Herculais, J. K. 210
Kane, W. F. deV. 209
Klages, E. 180
Kobert, R. 210
Michalovitch, N. 210
Smith, B. H. 88
Smith, H. H. (ill.)..... 211
Webb, S. 210

PERSONALS.

Bruner, L. 231
Leng, C. W. 230
McDunnough, J. 102
Michalovitch, N. 210

REVIEWS.

Comstock: The Wings of Insects 148
Fletcher: Report of the Imperial Entomologist, India. 237
Lochhead: Class Book of Economic Entomology 209
Miyake: Studies on the Fruit-flies of Japan 237
Moore & Hirschfelder: An Investigation of the Louse Problem 270
Oberthur: Études de Lepidoptérologie Comparée 304
Porter: A Collector's Manual in Spanish 53
Rau & Rau: Wasp Studies Afield 54
Ruggles: Report of the State Entomologist of Minnesota 270
Washburn: Injurious Insects and Useful Birds 54

GEOGRAPHICAL DISTRIBUTION.

Alabama: Orth., 81.
Arizona: Col., 156, 188. Hem., 217. Lep., 245.
Arkansas: Col., 24.
California: Dipt., 249. Col., 153, 188, 231, 243. Hem., 1, 103, 247, 275. Lep., 240, 243, 260.
Colorado: Dipt., 23, 219. Hym., 286.
Connecticut: Lep., 61, 113.
Florida: Col., 190. Dipt., 57. Orth., 81.
Georgia: Hym., 298. Orth., 81.
Idaho: Dipt., 140.
Illinois: Dipt., 9, 25. Hem., 5. Lep., 228.
Iowa: Lep., 38.
Kansas: Dipt., 21.
Maine: Hem., 186.
Maryland: Col., 119. Hem., 2, 184.
Massachusetts: Arach., 165. Hem., 247. Lep., 111. Odon., 10.
Missouri: Hem., 5. Lep., 14, 94, 198.
Montana: Dipt., 201.
New Hampshire: Dipt., 140. Lep., 48, 56.

New Jersey: Col., 57, 58, 88, 119, 124, 277, 304. Dipt., 27, 144, 179, 278. Hem., 277. Hym., 278. Lep., 58, 251, 277. Odon., 277.
New Mexico: Odon., 22.
New York: Dipt., 144. Hem., 184. Lep., 57.
North Carolina: Hem., 247. Odon., 105.
Ohio: Hem., 185. Lep., 109, 127, 264.
Oregon: Hem., 1, 221.
Pennsylvania: Col., 88, 119, 120, 150, 238, 239. Dipt., 179, 239, 240, 304. Hem., 184. Hym., 239. Lep., 56, 119, 179, 180, 239, 240, 247, 304.
Tennessee: Orth., 81.
Texas: Col., 155. Dipt., 279. Lep., 95, 191. Orth., 82.
Utah: Lep., 216.
Virginia: Col., 239. Hem., 186, 247.
Washington: Dipt., 140.
West Virginia: Hem., 194.
Wisconsin: Hem., 5, 39.
Wyoming: Col., 198.

Canada: Dipt., 141, 221.
Mexico: Hym., 41. Lep., 100.
Central America: Dipt., 250. Hym., 41. Lep., 216. Odon., 31, 72, 160.
South America: Dipt., 271. Hem., 27. Hym., 17, 41. Lep., 169, 174, 181.
Europe: Dipt., 172.
Asia: Hem., 3, 230.

ARACHNIDA.

Flights of spiders in autumn 165
gigantcus, Mastigoproctus ... 26
Mastigoproctus (see *gigantcus*).
Spiders, Flights of 165
Vinegarone, Note on 26

COLEOPTERA.

Acmaeodera (see *sinuata, sex-notata, wenzeli, wheeleri, squamosa, quadrivittata, pubiventris, plagiaticauda, cubaccola, cribricollis*).
Additions to New Jersey records 277
Bledius (see *dissimilis, philadelphicus, fratellus, transitus*).
Borneo Coleoptera, Richness of 252
Buprestidae from western U. S. 151, 186
candida, Saperda 24
Cerambycidae from Wyoming, New genus 198
Change of names 26
cribricollis, Acmaeodera 190
cubaccola, Acmaeodera (ill.). 190
cyanipes, Poecilonota 277
dissimilis, Bledius 26
erecta, Poecilonota cyanipes.. 277
fratellus, Bledius 26
Habits of *Silpha inaequalis*.. 253
inaequalis, Silpha 253
japonica, Popillia 58
Life cycle of *Saperda candida* 24
Life history and habits of *Silpha inaequalis* 253
*Megacheuma** 198
*melanosticum**, *Megacheuma* (ill.) 199
Occurrence of *Schizax senax* in California 231
*philadelphicus**, *Bledius* 26
plagiaticauda, Acmaeodera .. 189
Poecilonota (see *cyanipes, erecta, thurcura*).
Popillia (see *japonica*).
Poplar leaf-miner, *Zeugophora scutellaris* (ill.)..... 124
pubiventris, Acmaeodera (ill.) 188
quadrivittata, Acmaeodera .. 188

Saperda candida reared in an apple 24
Schizax senax in California. 231
scutellaris, Zeugophora 125
senax, Schizax 231
sex-notata, Acmaeodera sinuata* (ill.) 153
Silpha inaequalis, Life history and habits of 253
sinuata, Acmaeodera* (ill.).. 152
squamosa, Acmaeodera* 187
thurcura, Poecilonota 277
transitus, Bledius* 26
wenzeli, Acmaeodera* (ill.). 154
wheeleri Acmaeodera* (ill.). 155
Zeugophora scutellaris, in New Jersey 124

DIPTERA.

Acyphona (see *Erioptera*).
Additions to New Jersey records 278
Aedes (see *currici*).
aenea, Myiophasia 282
aerea, Chalcomyia 25
albifrons, Sturmia 284
americana, Plagia 284
ammophilus, Asyndetus 248
analis, Archytas 279
analis, Chaetogaedia 280
appendiculatus, Asyndetus ... 248
archippivora, Frontina 281
Archytas (see *analis*).
Asyndetus, New, with table of North American species ... 248
atlantica Sarcofahrtia* (ill.). 203
Belvosia (see *bifasciata*).
bifasciata, Belvosia 280
Bittacomorpha (see *clavipes*).
caerulescens, Medeterus* 8
capitata, Gonia 281
caudatus, Asyndetus 248
*Camposella** 271
Celatoria (see *diabroticae*).
Chaetogaedia (see *analis*).
Chalcomyia (see *aerea*).
Chrysops, Collecting larvae of 131
Cistogaster (see *immaculata*).
claripennis, Phorocera 283
clavipes, Bittacomorpha 23
colei, Colpodia* 223
Collecting larvae of *Tabanus* and *Chrysops* 131
Colpodia (see *colei*).
consobrina, Porricondyla* ... 221
cornutus, Asyndetus 248
Crane-flies from California, New 214
currici, Aedes* 58
Cyrtidae, New genus from South America 271
diabroticae, Celatoria 281
Dicranoptycha (see *minima, tigrina, nigripes, winnemana, sobrina, germana*).
Dicranoptycha, Notes on the genus 19
distincta, Sturmia 284
doryphorae, Neopales 282
Doryphorophaga (see *Neopales*).
dunningii, Tachinophyto 285
eremi, Prionellus* 219
Erioptera (see *sparsa*).
Eumerus (see *strigatus*).
Exorista (see *pyste*).
floridensis, Pachyophthalmus 283
floridensis, Tachinophyto ... 285
fratellus, Asyndetus 248
Frontina (see *archippivora*).
fultonensis, Porricondyla* ... 222
germana, Dicranoptycha 20
Gonia (see *capitata*).
harbeckii, Asyndetus 248
hepatica, Limnophila* 215
Heteropterina (see *nasoni*).
*Hormosomyia** 220
immaculata, Cistogaster 280
insignata, Camposella* (ill.). 272
interruptus, Asyndetus 248

Itonid feeding on rust spores 144
johnsoni, Asyndetus 249
Larvae of *Tabanus* and of *Chrysops*, Collecting 131
Larval habits of *Chalcomyia aerea* 25
latus, Asyndetus 248
Leiomyza in North America.. 137
leucocephala, Metopia 282
limata, Sturmia 284
Limnophila (see *hepatica*).
longipalpis, Asyndetus* (ill.). 250
Lunate onion fly in New Jersey 27
madisoni, Sarcofahrtia* (ill.) 201
Malaria, Resurrected paper on mosquitos and 101
Medeterus, An undescribed species of 7
melanderi, Leiomyza* (ill.).. 141
Metopia (see *leucocephala*).
Midges, Non-gall-making ... 219
minima, Dicranoptycha* 21
montanensis, Sarcofahrtia* (ill.) 201
Mosquitos and malaria, Resurrected paper on 101
Myiophasia (see *aenea*).
nasoni, Heteropterina 281
Neopales (see *doryphorae*).
nigripes, Asyndetus (ill.).... 248
nigripes, Dicranoptycha 21
occidentalis, Asyndetus* (ill.) 249
oregonensis, Hormosomyia* . 220
Pachyophthalmus (see *floridensis*).
parvipalpis, Plagiprospherysa 284
Pelcteria (see *robusta*).
Phorocera (see *claripennis*).
Plagia (see *americana*).
Plagiprospherysa (see *parvipalpis*).
Porricondyla (see *consobrina, fultonensis*).
Prionellus (see *eremi*).
pyste, Exorista 281
quadripustulata, Winthemia.. 285
ravinia, Sarcofahrtia 203
robusta, Pelcteria 283
rubriventris, Senotainia 284
ruficauda Trichophora 285
Rust spores, Itonid feeding on 144
Sarcofahrtia (see *montanensis, madisoni, atlantica, ravinia*).
Sarcophagidae, North American 201
Senotainia (see *rubriventris, trilineata*).
slossonae, Leiomyza* 140
sobrina, Dicranoptycha 21
sparsa, Erioptera* 214
strigatus, Eumerus...27, 170, 278
Sturmia (see *albifrons, distincta, limata*).
syntormoides, Asyndetus 248
Tabanus, Collecting larvae of 131
Tachinidae, Notes on Texas. 279
Tachinophyto (see *floridensis, dunningi, vanderwulpi*).
texanus, Asyndetus 249
tigrina, Dicranoptycha* 21
Trichophora (see *ruficauda*).
trilineata, Senotainia 284
vanderwulpi, Tachinophyto .. 285
winnemana, Dicranoptycha .. 21
Winthemia (see *quadripustulata*).

HEMIPTERA.

Additions to New Jersey records 277
Aphid, New genus and species 39
*Asiphonaphis** 39
californica, Essigella* (ill.). 1
Camptobrochis (see *poecilus*).
Cicadas in Beluchistan, Abundance of 230
clavalis, Eupteryx flavoscuta* 185
Essigella (see *californica, pini*).

Eulachnus (see *thunbergii, rilcyi*).
Eupteryx, Key to nearctic species 182
flavoscuta, Eupteryx 185
*juniperivora**, *Lachnus* (ill.). 6
*juvenis**, *Eupteryx flavoscuta* 186
Kermes, Hymenopterous parasites of 255
Kermes parasite, *Euclemensia bassettella*, the 91
Lachnids, Comparative notes on 1
Lachnus (see *juniperivora*).
Longevity in insects 27
Margarodes (see *vitium*).
*marmoratus**, *Paracalocoris acceptus* 247
Melaphis from moss 194
*minutus**, *Melaphis* (ill.).... 195
Miridae, Notes on two 246
*multipora**, *Pseudodiaspis* (ill.) 275
nigra, Eupteryx flavoscuta .. 185
Paracalocoris (see *marmoratus*).
parvus, Unilachnus (ill.).... 6
Phylloxera from California.. 103
Phylloxera (see *stanfordiana, salicola*).
*pini**, *Essigella* (ill.) 2
poecilus, Camptobrochis 246
Preparation of Hemiptera for the cabinet 223
*pruni**, *Asiphonaphis* 39
Pseudodiaspis, New species of 275
*quadricornis**, *Tylocentrus* (ill.) 217
*rilcyi**, *Eulachnus* (ill.)..... 5
salicola, Phylloxera (ill.).... 104
Staining of coccids 142
*standfordiana**, *Phylloxera* (ill.) 103
*thunbergii**, *Eulachnus* (ill.). 3
Tylocentrus from Arizona ... 217
*Unilachnus** 5
vanduzei, Eupteryx 184
vitium, Margarodes 27

HYMENOPTERA.

Additions to New Jersey records 278
Anthophora (see *smithii*).
Ants captured by gummy exudations 115
*auricomans**, *Tachytes* 298
Bees from Peru, A new genus of 17
Bees of the genus *Neocorynura* 41
Bees of the Rocky Mountain National Park 286
Capture of ants by gummy exudations 115
Chalcid travels through blackbird 250
*Chlerogas** 18
chlorocion, Neocorynura 41
coloradensis, Prosopis 287
Crabro (see *montanus*).
cuprifrons, Neocorynura 41
frontis, Nomada 291
*glaucovirens**, *Halictus* 290
Halictine bees of the genus *Neocorynura* 41
Halictus (see *virgatellus, nigricallis, peralpinus, supranitens, glaucovirens, hudsoniellus, viridatulus*).
*hirsutipennis**, *Chlerogas* 18
*hudsoniellus**, *Halictus* 290
*kelloggi**, *Melissodes* 293
*knabiana**, *Neocorynura discolor* 41
lignys, Neocorynura 41
Melissodes (see *kelloggi*).
*millsi**, *Sphecodes* 288
montanus, Crabro 114

Neocorynura (see *knabiana, chlorocion, cuprifrons, lignys*).
nigricallis, Halictus 288
Nomada (see *frontis, siccorum, sedae*).
Parasites of Kermes 255
peralpinus, Halictus* 289
Phor (see *Nomada*).
Prosopis (see *coloradensis*).
Rocky Mountain National Park, Bees of 286
sedae, Nomada* 292
siccorum, Nomada (Phor)*. 291
smithii, Anthophora 293
Sphecodes (see *millsi*).
supranitens, Halictus* 289
Tachytes from Georgia, New 298
viridatulus, Halictus* 290
virgatellus, Halictus 288

LEPIDOPTERA.

Aberration of *Polygonia progne* (ill.) 112
Additions to New Jersey records 277
amaranthella, Coleophora* .. 129
Amastus from Argentina, New 174
*Amaurogramma** 261
Anosia plexippus, Swarming of 38
Anurapteryx (see *crenulata*).
apacheana, Argynnis 156
apicella, Coleophora* 109
Argynnis apacheana and Edward's plates of *A. nokomis* 156
Argynnis from Utah, New species 216
bassettella, Euclemensia (ill.) 91
cacca, Callosamia promethea. 58
Callosamia (see *cacca*).
Catagramma (see *horstii*).
Catocala minuta, Early stages of 196
Catocala obscura, Description of new variety of..... 196
Catocala titania, Early stages and descriptions of new varieties 14
Catocala (see also *eureka, distincta, obliterata*).
chromis, Copacodes* 100
clemenscella, Cosmopteryx ... 261
cloacella, Tinea 251, 277
Coleophora, Descriptions of new 108
Coleophora (see *apicella, viburniella, cretaticostella, polemoniella, cricoides, amaranthella, granifera*).
Collecting on Mt. Washington 48
Copacodes, New species of.. 100
Cosmopterygidae, Notes on, with descriptions of new genera and species 260
Cosmopteryx (see *clemenscella*).
Costa Rican butterflies 216
crenulata, Anurapteryx* 245
cretaticostella, Coleophora .. 111
Diacrisia virginica, Notes on 191
distincta, Catocala titania*... 16
Early stages of *Catocala*..14, 196
Epipsilia monochromatea, Notes on the life history of (ill.) 61
cricoides, Coleophora* 128
Euclemensia bassettella, the kermes parasite (ill.) 91
eureka, Catocala minuta*.... 16
Eurema mexicana in Illinois, Occurrence of 228
extensa, Amaurogramma* ... 262
falcata, Perimede* 263
formosana, Amastus* 174
Fungi, *Tinea* bred from..... 251
Geometrid from Arizona, New 245
granifera, Coleophora* 130

Gynandromorphic butterfly, An interesting 247
Haemactis, New species from South America 169
Hesperia syrichtus and *montivagus* 297
horstii, *Catagramma* (ill.)... 182
inconspicua, *Perisama* (ill.). 182
Ithome (see *unimaculella*).
Life history of *Epipsilia monochromatea* (ill.) 61
*martincae**, *Polygonia progne* (ill.) 112
metallifera, *Psacaphora* 264
mexicana, *Eurema* 228
Micropterygidae, Note on the wing-coupling apparatus in 168
minuta, *Catocala* 196
monochromatea, *Epipsilia* (ill.) 61
montivagus, *Hesperia* 297
Mt. Washington, A few hours on 48
nokomis, Edward's plates of *Argynnis* 156
*obliterata**, *Catocala minuta*. 17
*obvia**, *Catocala obscura*..... 198
Papilio (see *turnus*).
Perimede (see *falcata*).
*Periploca** 261
Perisama from South America, New 181
plexippus, *Anosia* 38
*polemoniella**, *Colcophora* ... 127
Polygonia progne, Aberration of (ill.) 112
Psacaphora (see *metallifera*).
*purpuriella**, *Periploca* 261
*pyrrhosphenus**. *Haemactis* (ill.) 169
*sinerubra**, *Perisama* (ill.).. 181
Sugaring for moths 298
Swarming of the Monarch butterfly 38
syrichtus, *Hesperia* 297
Tinea cloacella bred from fungi 251
titania, *Catocala* 14
turnus, *Papilio* 247
unimaculella, *Ithome* 262
*utahensis**, *Argynnis* 216
viburniella, *Colcophora* 110
virginica, *Diacrisia* 191
Wing-coupling apparatus in the Micropterygidae 168

ODONATA.

aaroni, *Neoneura* 165
aberrans, *Pseudostigma* 163
accedens, *Pseudostigma* 163
Addition to New Jersey record 277
Aeshna (see *cornigera*).
alcyone, *Cora marina* 162
alienum, *Heteragrion* 163
amazili, *Anax* 37
Anax (see *amazili*).
Anisoptera from Guatemala, 31, 72
Argia (see *oculata*, *difficilis*).
bovilla, *Metaleptobasis* 165
Brechmorhoga (see *vivax*, *pertinax*, *crocosema*, *inequiunguis*).
Cannaphila (see *funerea*).
capitalis, *Hetaerina* 161
coerulatus, *Megaloprepus* ... 163
Color pattern of *Gomphus crassus*, Variation in 294
Concord, Mass., Odonata of. 10
cophysa, *Tramea* 75
Cora (see *alcyone*).
Cordulegaster dorsalis as an enemy of trout 22
cornigera, *Aeshna* 37
Coryphaeschna, Naiad of the genus 105
crocosema, *Brechmorhoga rapax* 74

crassus, Gomphus 294
diadophis, Erpetogomphus (ill.) 36
difficilis, Argia 163
domitia, Perithemis 75
dorsalis, Cordulegaster 22
elongata, Gomphoides 33
Epigomphus (see *subobtusus*).
Erpetogomphus (see *schausi, diadophis*).
Erythrodiplax (see *umbrata, ochracea, fusca*).
ferruginea, Orthemis 73
foliata, Libellula 72
funerea, Cannaphila insularis 73
fusca, Erythrodiplax connata 74
Gomphoides (see *elongata*).
Gomphus (see *crassus*).
gracile, Acanthagrion 164
gracilis, Gynacantha 38
Gynacantha (see *septima, gracilis*).
herculea, Libellula 72
Hetaerina (see *tricolor, titia, macropus, capitalis*).
hinei, Rhodopygia 75
imbuta, Uracis 73
inequiunguis, Brechmorhoga.. 74
ingens, Coryphaeschna (ill.). 106
iris, Perithemis domitia 75
Lestes (see *tenuatus*).
Libellula (see *foliata, herculea*).
macropus, Hetaerina 161
Mecistogaster (see *modestus*).
Megaloprepus (see *coerulatus*).
Metaleptobasis (see *bovilla*).
modestus, Mecistogaster 163
Naiad of the genus *Coryphaeschna* 105
Neoneura (see *aaroni*).
ochracea, Erythrodiplax 74
oculata, Argia 163
Perithemis (see *domitia, iris*).
pertinax, Brechmorhoga 74
pseudimitans, Macrothemis... 75
Pseudostigma (see *aberrans, accedens*).
Rhodopygia (see *hinei*).
schausi, Erpetogomphus* (ill.) 33
septima, Gynacantha 37
subobtusus, Epigomphus 36
Sympetrum (see *virgula*).
tenuatus, Lestes 162
titia, Hetaerina 160
Tramea (see *cophysa*).
tricolor, Hetaerina 160
Trout. *Cordulegaster dorsalis* as an enemy of 22
umbrata, Erythrodiplax 74
Uracis (see *imbuta*).
Variation in color pattern of *Gomphus crassus* 294
virgula, Sympetrum illotum.. 77
vivax, Brechmorhoga 74
Zygoptera from Guatemala.. 160

ORTHOPTERA.

Cavotettix, Remarks on 78
Neotettix (see *proavus, nullisinus*).
nullisinus, Neotettix 81
Phylogeny of the Orthoptera (ill.) 42 64
proavus, Neotettix 79
Seventeen year grasshoppers 113

PRESS OF
F. C. STOCKHAUSEN
PHILADELPHIA

EXCHANGES.

This column is intended only for wants and exchanges, not for advertisements of goods for sale. Notices not exceeding three lines free to subscribers.

☞ These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and only when necessary those at the top (being longest in) are discontinued.

Wanted—Specimens of fleshy and woody fungi from which beetles have been collected, together with names of host trees, names of beetles, localities and dates. All specimens will be gratefully acknowledged and identified, and the information properly accredited. Harry B. Weiss, State Department of Agriculture, Trenton, N. J.

Wanted—Tipulidae from all parts of North America. Material from the far North especially desired. Will buy or exchange. Dr. W. G. Dietz, 21 North Vine Street, Hazleton, Pa.

For Exchange—Live pupae of *E. tityrus* and *H. tenuis*. What have you to offer? Joseph Syrovy, Jr., 4119 W. 21st Place, Chicago, Illinois.

Coleoptera. Cotypes of *Chrysobothris falli* VanDyke for exchange for rare Buprestidae, domestic or foreign. Also other species for exchange. Richard T. Garnett, 3600 Broadway, Oakland, California.

Noctuidae.—Will purchase, or exchange Lepidoptera from western states for the rarer noctuid moths of N. Am. Desire Hampson's work on this family, also other literature. Chas. A. Hill, Hamilton Apts., No. 310, Omaha, Nebraska.

Wanted for Cash—Central and South American (especially Brazilian) Rhopalocera in papers. Good condition. Dr. G. Granville Buckley, Rye Croft South, Manchester Road, Bury, Lancashire, England.

Complete Collection of Syrphid flies from this locality, all mounted with full data and correctly named, for exchange or sale. Desire Buprestidae and Cerambycidae, preferably from West. Alan S. Nicolay, 416a Grand Avenue, Brooklyn, New York.

Wanted—Perfect sp. of Cat. marmorata, walshii, arizonae, babayaga, desdemona, herodias, consors, somnus, agrippina, sappho, phrynia. I offer A-1 flebilis, lacrymosa, evelina, paulina, obscura, angusi lucetta, retecta, luctuosa, vidua, residua, epione, unijuga, partia, pura, purissima, aholibah, coloradensis, aspasia, faustina, luciana, zoe, innubens, hinda, scintillans, nubilis. Will give also exotics in exch.—Vl. G. Sasko, 2346 Walton St., Chicago, Ill.

For Exchange—Living pupae of Sphingidae, also bred specimens mounted; bred Catocalas; other material on pins and in paper. Wanted, N. A. and exotic Lepidoptera, N. A. Catocalas preferred. —Herman J. Erb, 925 Hatch Ave., Woodhaven, Long Island, N. Y.

Wanted—Therevidae from all parts of North America. Monographing family. Will exchange Diptera or other orders.—R. W. Doane, Department of Entomology, Stanford University, Cal.

For Exchange—*Dicerca lepida* Lec. and other Coleoptera in exchange for Buprestidae. J. N. Knull, Hummelstown, Pa.

Catocalae—For exchange—*gracilis, similis, crataegi, ultronia, unijuga, cara, amatrix, concumbens, antinympha, annida, retecta.* E. Baylis, 5011 Saul St., Philadelphia, Pa.

Books Wanted—Volumes 11 and 14, Entom. News. Brooklyn Museum Library, Eastern Parkway and Washington Ave., Brooklyn, N. Y.

RECENT LITERATURE

FOR SALE BY

THE AMERICAN ENTOMOLOGICAL SOCIETY

1900 RACE ST., PHILADELPHIA, PA.

COLEOPTERA.

795.—**Blaisdell** (F. E.).—Studies in Alaudes (Tenebrionidae). (Trans., **45**, 307-313, 1919) ..... .15

796.—**Blaisdell** (F. E.).—Synopsis and review of the species of Coelus (Tenebrionidae). (Trans., **45**, 315-334, 1 pl., 1919) ..... .40

DIPTERA.

2126.—**Van Duzee** (M. C.).—Two new Asyndetus with a table of the North American species. (Ent. News, **30**, 248-250, Ill., 1919) ..... .10

HEMIPTERA AND HOMOPTERA.

2129.—**Ferris** (G. F.).—A new species of Pseudodiaspis. (Ent. News, **30**, 275-276, ill., 1919) ..... .10

2125.—**McAtee** (W. L.).—Notes on two Miridae, Camptobrochis and Paracalocoris. (Ent. News, **30**, 246-247, 1919) ..... .10

HYMENOPTERA.

2131.—**Bradley** (J. C.).—A new Tachytes from Georgia. (Ent. News, **30**, 298, 1919) ..... .10

2130.—**Cockerell** (T. D. A.).—Bees of the Rocky Mountain National Park. (Ent. News, **30**, 286-291, 1919) ..... .15

LEPIDOPTERA.

2127.—**Weiss** (H. B.).—Tinea cloacella, bred from fungi. (Ent. News, **30**, 251-252, 1919) ..... .10

2128.—**Braun** (A. F.).—Notes on Cosmopterygidae, with descriptions of new genera and species. (Ent. News, **30**, 260-264, 1919) ..... .10

ODONATA.

797.—**Calvert** (P. P.)—Gundlach's work on the Odonata of Cuba: a critical study. (Trans., **45**, 335-396, 3 pls., 1919) 1.10

ORTHOPTERA.

M-4.—**Hebard** (M.).—The Blattidae of Panama. [A monographic study, describing 10 n. gen., 31 n. sps.]. (Mem., **4**, 148 pp., 6 pls., 1919) 2.50

ELCO

When we first used this word, it meant Elco Card Index Mounts only. The word Elco, as now used, applies to our entire line of Lepidoptera Specialties and Supplies, made and sold by us. It is our intention to increase this line as fast as it is practical to do so.

The items ready for business are listed below. A number of others will be ready during the winter.

THE ELCO LINE

Dept. 1—Stock Department, Lepidoptera—Papered or pinned; mounted in Elco Art Mounts, Riker Mounts, Elco Wing Mounts. Prices on application.

Dept. 2—Art Department, Elco Butterfly Art Mounts
5 x 6 inches, $1.25; 8 x 12 inches, $2.50; 12 x 16 inches, $5.00

Dept. 3—Supply Department, Elco Labels
Ruled, white, ¾ x 1¼, 65c. per 1000
Plain, white, gummed, ¾ x 1¼, 50c. per 1000
Plain, bristol board, 65c. per 1000

Elco Index Tabs—Eight colors gummed, ¼ x ⅞, for color classification of records and specimens, 25c. per 1000, assorted.

Elco Celluloid Spreading Strips—Transparent, assorted lengths, 10c. per 1000

Elco Card Index Specimen Mounts
3 x 5, 10c. each; 4 x 6, 15c. each; 5 x 8, 20c. each.

Elco Card Index Wing Mounts—Prices of sets on application.

Dept. 4—Collector's Service Department—Information in regard to this Department on request.

S. C. CARPENTER, Lepidoptera, 62 So. Whitney Street, Hartford, Conn.

FOR SALE

BUTTERFLY COLLECTION Containing Over 700 Different Species mounted on Cotton in 60 glass-covered drawers, in oak cabinet, with large bottom drawer.

CARLO ZEIMET - - - PLANTSVILLE, CONN.

RECENT ARRIVALS:

Papilio horishanus (n. sp.), Formosa. Large. Perfect. Males only $8.00. Lot 50 Formosan Butterflies, includes many rarities, $10.00. Cheap lots from Africa, South America or India, 50 for $5.00. 500 each Morpho amazonicus and deidamia to be sold quick; first quality, 35c.; seconds, 25c. 15% discount for 100 lots. Thousands of butterflies always in stock.

G. G. MACBEAN, Lepidopterist, Assiniboia, Sask., Canada

INSECT LIFE HISTORIES

of all descriptions prepared for Colleges, Schools, Departments of Health, etc.

Insects for Dissections. Pressed Cork. Send for Lists.

NEW JERSEY ENTOMOLOGICAL COMPANY

P. O. Box 432 **Perth Amboy, New Jersey**

NEW ARRIVALS

From Columbia, So. America:

OVER 10,000 BUTTERFLIES, INCLUDING

Morpho cypris
" sulkowskyi
Morpho amathonte
Caligo spp.

From Cuba:

1500 BUTTERFLIES AND MOTHS, INCLUDING

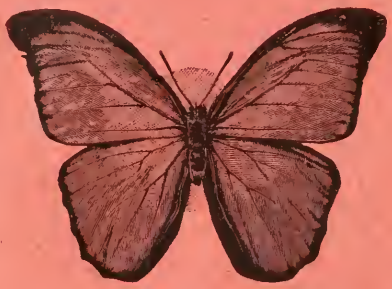
Papilio columbus
" andraemon
" celadon
" devilliersi
Urania boisduvali
Erinyis guttalaris
Protoparce brontes, etc.

From Venezuela:

Over 5000 Lepidoptera
200 Dynastes hercules

From New Guinea:

2000 Coleoptera
200 Orthoptera



From Assam, India:

1200 BUTTERFLIES AND MOTHS, INCLUDING

Papilio arcturus
" philoxenus
Kallima inachis
Brahmaea wallachi

And Many Other Showy Species

From Tibet (Bhutan)

Armandia lidderdalii
Parnassius hardwicki

CATALOGUES OF ENTOMOLOGICAL SUPPLIES AND SPECIMENS ON APPLICATION

If interested kindly send your list of desiderata for further information to

THE KNY-SCHEERER CORPORATION

Department of Natural Science
G. Lagai, Ph.D.

New York
404-410 W. 27th Street

900 1

News.

SMITHSONIAN INSTITUTION LIBRARIES
3 9088 00844 5322